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Teaching Well-Being increases Academic Performance: Evidence From Bhutan, Mexico, and Peru

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Abstract
Can well-being be taught at a large scale, and should it be taught in schools? Does teaching well-being improve academic performance? In Study 1, 18 secondary schools (n=8,385 students) in Bhutan were randomly assigned to a treatment group (k=11) or a control group (k=7). The treatment schools received an intervention targeting ten non-academic well-being skills. Study 2 was a replication study at a larger scale in 70 secondary schools (m = 68,762 students) in Mexico. The schools were randomly assigned to a treatment group (j = 35) or a control group (j = 35). Study 3 was the last replication study at a larger scale in 694 secondary schools (q = 694,153 students) in Peru. The schools were randomly assigned to a treatment group (h = 347) or a control group (h = 347). In all three studies, students in the intervention schools reported significantly higher well-being and they performed significantly better on standardized national exams at the end of a 15-month intervention. In Study 1, the results for both well-being and academic performance remained significant 12 months after the intervention ended. For Studies 2 and 3, time will tell if our results endure 12 months after the end of the intervention. In all three studies, perseverance, engagement, and quality of relationships emerged as the strongest mechanisms underlying increases in well-being and enhanced academic performance. Our results suggest that, independent of social, economic, or cultural contexts, teaching well-being in schools on a large scale is both feasible and desirable.

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TEACHING WELL-BEING INCREASES ACADEMIC PERFORMANCE: EVIDENCE FROM BHUTAN, MEXICO, AND PERU

Alejandro Adler

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To my mother and my father, with all of a son's love

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my life with you, with a joint vision for the world, with our shared values, and with our home, one that we can always come back to, to celebrate the best moments in life and to balm and rekindle each other with love during the challenges that we will encounter and grow from together. Thank you, for everything.

ABSTRACT

TEACHING WELL-BEING INCREASES ACADEMIC PERFORMANCE: EVIDENCE FROM BHUTAN, MEXICO, AND PERU

Alejandro Adler

Martin E.P. Seligman

Can well-being be taught at a large scale, and should it be taught in schools? Does teaching well-being improve academic performance? In Study 1, 18 secondary schools (n=8,385 students) in Bhutan were randomly assigned to a treatment group (k=11) or a control group (k=7). The treatment schools received an intervention targeting ten non-academic well-being skills. Study 2 was a replication study at a larger scale in 70 secondary schools (m = 68,762 students) in Mexico. The schools were randomly assigned to a treatment group (j = 35) or a control group (j = 35). Study 3 was the last replication study at a larger scale in 694 secondary schools (q = 694,153 students) in Peru. The schools were randomly assigned to a treatment group (h = 347) or a control group (h = 347). In all three studies, students in the intervention schools reported significantly higher well-being and they performed significantly better on standardized national exams at the end of a 15-month intervention. In Study 1, the results for both well-being and academic performance remained significant 12 months after the intervention ended. For Studies 2 and 3, time will tell if our results endure 12 months after the end of the intervention. In all three studies, perseverance, engagement, and quality of interpersonal relationships emerged as the strongest mechanisms underlying how increases in well-being improved academic performance. Our results suggest that, independent of social, economic, or

cultural context, teaching well-being in schools at a large scale is both feasible and desirable.

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PREFACE

"Those who educate children well are more to be honored than they who produce them; for these only gave them life, those the art of living well."

- *Aristotle (384 BC – 322 BC)*

"Education is the most powerful weapon which you can use to change the world."

- *Nelson Mandela (1918 – 2013)*

Human beings are cognitively, emotionally, and behaviorally malleable (Bandura, Adams, & Beyer, 1977; Rudman, Ashmore, & Gary, 2001; Schaefer et al., 2002). What can we aspire to when we shape human beings, particularly in education settings? Education has the implicit connotation that it prepares humans for life during their earliest and two most malleable phases: childhood and adolescence (Compas et al., 2001). Reflecting the global economic transition during the 18th and 19th Century Industrial Revolution, our current education system seeks to prepare students to excel academically and to eventually be productive in the workplace. It does not, however, teach students the skills, knowledge, and wisdom that they need to flourish in life beyond grades, standardized exams, and productivity reflected in monetary wages. Our current education system does not teach children and adolescents how to live what has perennially and universally been deemed as the good life – a life infused with meaning, purpose, love, virtue, character, connectedness, health, and a sense of self-efficacy, autonomy, and mastery (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009). In short, our prevailing education system does not teach our youth how to develop and master the art of living well.

Pivotal thinkers from distinct epochs and civilizations declared that education can and should mold the whole human being to achieve her highest potential in all domains of life – that it should teach character and well-being (Palmer, Bresler, & Cooper, 2001; Sherman, 1989). These intellectual titans relied on experiential, anecdotal, and introspective information to make these claims. They did not, however, have the scientific instruments available today to empirically ask whether the education they proposed is feasible.

I have dedicated the last five years of my life to experimentally answer two questions:

1. Can we teach the skills for well-being at a large scale?
2. Does teaching well-being contribute to better academic performance?

After many research journeys across the world, I can confidently and empirically say that the answer to the above two questions is undeniably affirmative. In the following pages, I relate my doctoral efforts to experimentally answer these questions. I used the best available instruments from the sciences that study and promote well-being, including positive psychology to a significant extent, in field randomized controlled trials. In this document, my doctoral dissertation, I report my findings from Bhutan, Mexico, and Peru.

I conclude my doctoral studies convinced that a new education paradigm in which we teach well-being in parallel to academic performance is both desirable and feasible, regardless of social, economic, or cultural context. This education model can and should guide local, national, and international education public policy. I will dedicate the rest of my life to promote this new paradigm and help sow the seeds for the world to which humanity can aspire.

University of Pennsylvania, Philadelphia

April, 2016

Teaching Well-being Increases Academic Performance: Evidence from Bhutan, Mexico, and Peru

Introduction

Embedded in the concept of education is the notion of changing individuals in a particular direction, of taking them from their current state to, ideally, a better one. That direction is informed by how we measure success in an educational setting. If schools measure only academic performance, as they traditionally have, then effective schools will, at best, produce students who learn how to excel academically and perform well on standardized tests. However, if schools choose to measure multifaceted well-being as well, and hence also teach skills for well-being, they can also enable their students to lead flourishing lives.

The existing literature has empirically demonstrated that the skills and knowledge to succeed academically can be reliably taught (Rivkin, Hanushek, & Kain, 2005; Credé & Kunce, 2008). Further, the most prevalent pedagogical paradigm posits that the objective of education is to teach students to succeed academically and it proposes that teaching well-being might divert valuable resources from academic subjects and interfere with students' learning (Spence & Shortt, 2007). Schools and standardized exams around the world are currently structured around this pedagogical paradigm.

Humans, however, strive for well-being beyond academic and professional success (Seligman, 2011). Schools do not teach the skills and knowledge for more positive emotions, better relationships, more engagement, and more purpose and meaning in life. Individual well-being is widely considered to be a private matter, especially if teaching the skills for it consumes scarce educational resources and undermines academic learning.

It is fair to argue that opportunities for the health, safety, educational progress, and the moral development of youth are almost universally desired (Cohen, 2006; Land, Lamb, & Mustillo, 2001; Martens & Witt, 2004). Peterson (2006) contended that schools are uniquely conducive to these opportunities; he called for schools to expand their focus beyond academic learning to also include the promotion of character and well-being.

Existing data prior to the results we present show that, under specific controlled conditions and at a small scale, the skills for well-being are learnable and that well-being and academic achievement are not mutually exclusive; rather, they are mutually reinforcing (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Greenberg et al., 2003; Seligman et al., 2009). Before the studies that we present, it is not possible to empirically assert that well-being is teachable at a large scale and that it contributes to better academic learning.

What is Youth Well-being?

A missing element to existing models of well-being, primarily based on adult research, is the obvious precursor – the well-being and functioning of youth. The literature on developmental psychology has mostly focused on child and adolescent psychopathology, with limited attention on youth well-being. Adolescence is a particularly significant developmental and malleable period in life (Steinberg & Morris, 2001). The thriving of adolescents is often evaluated by academic performance and little else.

In adults, well-being is best characterized as a profile of indicators across multiple domains, rather than as a single factor (Forgeard, Jayawickreme, Kern, & Seligman, 2011; Keyes, 2007; Lerner, Phelps, Forman, & Bowers, 2009; Organization for

Economic Cooperation and Development [OECD], 2012; Ryff & Keyes, 1995). There are both theoretical and practical reasons for approaching well-being as a multidimensional construct across valued life domains (Huppert & So, 2013). On the theoretical side, well-being is an abstract construct that includes both feeling good (hedonic well-being) and functioning well (eudaemonic well-being; Huppert, 2014). Well-being is not best defined by a single measure; rather, it is comprised of various domains that can be reliably and usefully measured (Seligman, 2011).

Existing models offer different well-being domains. For instance, Seligman's (2011) Well-being Theory delineates five domains of life that people pursue as ends in themselves: positive emotion, engagement or flow, positive relationships, meaning or purpose, and achievement, or PERMA. Ryff (1995) suggests six components of well-being: self-acceptance, positive relationships with others, autonomy, environmental mastery, purpose in life, and personal growth. At the societal level, Gallup has created the Healthways Well-being Index that includes life evaluation, emotional health, physical health, healthy behaviors, work environment, and access to basic needs (Kahneman & Deaton, 2010). The Organization for Economic Cooperation and Development (OECD) has created the *Your Better Life Index*, comprised of 11 topics considered essential to quality of life (housing, income, jobs, community, education, environment, governance, health, life satisfaction, safety, work-life balance). The index allows countries and individuals to identify the domains that are most important to them (Kerényi, 2011).

One of the advantages of a "dashboard" (multidimensional) approach to well-being is that individual domains may differentially contribute to outcomes of interest. For example, a review of positive psychological well-being and cardiovascular outcomes

found that optimism reliably predicted lower risk of cardiovascular disease and mortality, but findings were mixed for other aspects of well-being (Boehm & Kubzansky, 2012). Similarly, Diener and Chan (2011) noted that studies are needed to "determine how the concepts are related to one another, and their independent ability to predict health outcomes beyond a general [subjective well-being] factor score" (p. 27). Positive constructs are often highly correlated with one another, yet it is most productive and scientifically responsible to study them independently (Friedman & Kern, 2014). Only by simultaneously considering multiple domains and taking into account factor inter-correlations can we see which factors, and what mechanisms, drive different outcomes.

Adolescent well-being researchers have proposed five factors of youth well-being that are somewhat analogous to the five domains of Seligman's (2011) Well-being Theory: engagement (absorption and focus on what one is doing and interested in life activities), perseverance (pursuing goals to completion, despite setbacks), optimism (hopefulness and confidence for the future), connectedness (satisfying relationships with others, feeling loved, and providing friendship to others), and happiness (positive affect), or EPOCH (Kern, Waters, Adler, & White, 2015). The EPOCH factors mirror PERMA's five-factor structure, with domains for meaning and accomplishment being represented by optimism and perseverance, respectively (Kern, Waters, Adler, & White, 2014). The EPOCH measure of adolescent well-being has been internationally validated in various cross-cultural populations (Kern, Benson, Steinberg, & Steinberg, 2015).

Can We Measure Youth Well-being?

Corresponding to unidimensional and multidimensional models of well-being, validated corresponding measures of well-being exist. Below, we present a constellation of the most widely used survey instruments for youth well-being.

The Positive and Negative Affect Schedule for Children (PANAS-C; Laurent et al., 1999) assesses 15 positive and 15 negative emotions felt over the past month. Positive emotions include joy, excitement, and interest; negative emotions include sadness, stress, and fear. The Satisfaction with Life Scale (adapted for children) measures individuals' assessment of their lives as a whole (α = .86; Gadermann, Schonert-Reichl, & Zumbo, 2010). The Children's Hope Scale (Snyder et al., 1997) assesses agency and pathways of hope (e.g., "I think the things I have done in the past will help me in the future", 6 items, α = .84). The Gratitude Questionnaire (McCullough, Emmons, & Tsang, 2002) assesses stable tendencies to experience gratitude in daily life (e.g., "I have so much in life to be thankful for", 6 items, α = .71). The Growth Mindset scale (Dweck, 2006) assesses the extent to which individuals believe their mindsets are fixed versus open to growth and experience (e.g., "No matter how much intelligence you have, you can always change it quite a bit", 6 items, α = .85).

The Healthy Pathways Child Report Scales (Bevans, Riley, & Forrest, 2010) are unidimensional scales that assess aspects of health, illness, and well-being in clinical and population-based research studies involving youth in transition from childhood to adolescence. The instrument measures physical vitality (e.g., "how often do you feel really healthy?" 4 items, α = .81), somatic symptoms (e.g., "how often do you have a headache?" 4 items, α = .72), physical activity (e.g., "How often do you play physically

active games or sports?" 4 items, $\alpha = .84$), and school engagement (e.g., "How often were you interested in the work at school?" 4 items, $\alpha = .83$).

Unidimensional survey instruments of domains such as life satisfaction are strongly affected by an individuals' mood at the time, and they ignore other aspects of well-being. In fact, multidimensional measures of well-being are only moderately correlated with life satisfaction (Huppert & So, 2013). Further, reducing measures to a unidimensional notion obscures potentially valuable multi-faceted information. There are few validated multidimensional well-being scales for youth. This is one of the most important gaps in the youth well-being literature, compared to the study of adult well-being. One of them is the EPOCH Measure of Adolescent Well-being, a 20-item multidimensional measure of flourishing for youth, which assesses engagement, perseverance, optimism, connection to others, and happiness (Kern et al., 2015). Just as multiple components are necessary to define and understand adult well-being, Kern and colleagues (2015) suggest that a multifaceted approach to adolescent well-being is necessary. In the three studies that we present, we mainly used the EPOCH instrument to measure adolescent well-being, since it reflects the best of experimental well-being science, both in its multidimensionality and in its content.

An advantage of multidimensional well-being metrics is that they can identify individuals' specific strengths and weaknesses. In education, overall grade point average indicates a student's overall performance, but it obscures individual academic areas in which students thrive and struggle. Report cards break down grades across subject areas, signaling weak areas. Similarly, assessments of well-being need to go beyond global unitary assessments to provide teachers and school counselors with specific information

about domains in which students do well, average, or poorly. For example, two individuals can score similarly on overall well-being, but one scores high on engagement, moderately on competence, and low on self-esteem, whereas the other scores moderately on engagement, low on competence, and high on self-esteem. With this dashboard of information, the two individuals will probably make different decisions based on their strengths and deficiencies.

Compared to the study of adult well-being, there is significantly less research on youth well-being theory and measurement. Positive psychology has advanced its mission of balancing the study of the human brain, mind, and behavior in adults so that both negative and positive domains are scientifically explored. However, the developmental psychology literature still remains skewed towards a deficiency model of humans, focusing on studying psychopathology and on eliminating mental illness and toxic behaviors. A positive developmental psychology has started to emerge, but there are substantial theoretical, measurement, and experimental gaps in the literature, compared to adult positive psychology. Regardless, the theory and measurement of youth well-being are advanced enough to inform experimental research on youth well-being, including its causes, its effects, and the mechanisms underlying these relationships. Particularly for the three studies in this paper, youth well-being theory and measurement were developed enough to answer empirical questions about student well-being and academic performance using rigorous experimental methods. Before delving into our three randomized controlled trials in Bhutan, Mexico, and Peru, we make a case for why the time is right to experimentally address the paucity of research in this fertile scientific territory.

Positive Education: Putting Well-being on the Global Education Agenda

Drawing on the field of positive psychology, positive education offers a new educational model that, in parallel to academic learning, emphasizes positive emotions, character traits, and personalized motivation to promote learning (Seligman et al., 2009). Positive education focuses on cultivating student, teacher, and administrator well-being in parallel to teaching academic achievement skills. It recognizes that well-being has both intrinsic and instrumental value.

The psychological literature offers several compelling empirical arguments for adopting a positive education model. Existing evidence suggests that youth well-being contributes to academic achievement, fewer risky adolescent behaviors, and better physical health during adolescence and adulthood (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Hoyt, Chase-Lansdale, McDade, & Adam, 2012). Further, studies have shown that well-being is a protective factor against youth depression and that it promotes creativity, social cohesion, and civic citizenship (Nidich et al., 2011; Seligman et al., 2009; Wang, Haertel, & Walberg, 1997; Waters, 2011).

Beyond the schooling years, longitudinal analyses have shown that adolescent well-being predicts life-outcomes in adulthood, including physical health, marriage strength, delinquency, gang membership, risky sex, drug abuse, and obesity (Bogg & Roberts, 2004; Hamre & Pianta, 2001; Howell, Kern, & Lyubomirsky, 2007; Hoyt, Chase-Lansdale, McDade, & Adam, 2012; Kern & Friedman, 2008; Lyubomirsky, King, & Diener, 2005; Pressman & Cohen, 2005; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003; Tsukayama et al., 2010).

Beyond cross sectional and longitudinal studies on well-being and its correlates, it is important to explore which domains of well-being are changeable and how to best change them, as well as other domains of life to which they contribute.

Existing Well-being Interventions in Schools

Previous studies have even shown that without whole-school cultural and pedagogical shifts, well-being interventions are often ineffective and at times interfere with learning (Spence & Shortt, 2007). Well-being interventions in schools are most effective when they are not limited to one classroom, but rather when they permeate all facets of an educational institution: students, teachers, staff, leadership, existing academic subjects, and extra-curricular activities. Institutional shifts provide the most enabling conditions for well-being interventions and for the downstream effects of well-being, which might include increased academic performance.

A starting point for building a supportive, respectful, and connected school culture is to help a school community clarify and reach agreement about the values that guide a school's practices. If a school articulates well-being through its vision statement, policies, structures, and teaching practices, then these values form a compass that guides how individual in the school community interact and communicate, and it informs the choices they make. The results from a longitudinal study that tracked high school students over fifty years into late adulthood suggests that learning to act in accord with prosocial values may contribute to sustained well-being. The students in the study were interviewed every ten years, and the results showed that adolescents who lived in accordance with prosocial values became both psychologically and physically healthier adults (Wink & Dillon, 2003).

As a public policy case study, the Australian Government has recognized the critical importance of a whole-school approach to well-being in its Values Education Project, which involved 166 schools and 70,000 students. Longitudinal data on the project showed that even though involving whole-schools was resource intensive, there were deeper commitments to the program, better results, and longer continuity using a whole-school approach, compared to similar prior programs that did not use a whole-school approach (Lovat & Toomey, 2009). However, none of the studies in the Values Education Project used experimental methodologies.

There is increasing evidence on the effectiveness of interventions exclusively targeting well-being; among them is the Penn Resiliency Program (PRP). Its curriculum seeks to teach students several skills, including optimism, creativity, relaxation, decision making, assertiveness, problem solving, and coping skills. During the past two decades, close to 20 studies involving more than 2,000 children have evaluated the impact of the PRP compared to control groups (Seligman, et al., 2009). The data have found the PRP to reduce symptoms of depression, reduce behavioral problems, work equally well for children of different races and ethnicities, and be most effective with adequate training and supervision (Brunwasser & Gillham, 2008; Gillham, Brunwasser, & Freres, 2007; Seligman, et al., 2009).

Resistance to teaching well-being in schools comes mostly from a reasonable belief that teaching well-being might interfere with academic learning. Thus, in our studies, we explored not only how to increase well-being as an end in itself, but also the effects of well-being on academic performance and other life outcomes.

Youth Well-being and Achievement

Many are rightly skeptical about incorporating well-being to schools' curricula due to limited rigorous experimental evidence on the effects of well-being on academic achievement. During the last few decades, most research on the impact of well-being on academic achievement has focused on the detrimental effects of mental illnesses. Meta-analyses show that mental illness contributes to lower grades, higher absenteeism, lower self-control, and higher dropout rates (Hinshaw, 1992; McLeod & Fettes, 2007). Even though research on youth well-being and academic achievement increasingly suggests that individual flourishing contributes to enhanced educational performance, there is a surprising paucity of rigorous experimental data. Before the three studies in this paper, the existing data could not causally establish that teaching well-being increases academic performance.

Studies on subjective well-being have shown that negative emotions may contribute to restricted attention and that positive affect is associated with more creative thinking, more holistic thinking, and broader attention (Bolte, Goschke & Kuhl, 2003; Estrada, Isen, & Young, 1994; Fredrickson, 1998; Fredrickson & Branigan, 2005; Isen, Daubman, & Nowicki, 1987; Isen, Rosenzweig, & Young, 1991; Kuhl, 1983, 2000; Rowe, Hirsh, Anderson, & Smith, 2007). A recent one-year longitudinal study with American middle school students found that even though anxiety and depression predicted school absenteeism, they did not predict students' grades. In the same study, students' subjective well-being (positive affect and life satisfaction) predicted better grades, particularly in math and reading (Suldo, Thalji, & Ferron, 2011).

Positive school relationships seem to contribute to academic achievement. A meta-

analysis of 148 studies involving 17,000 students conducted in 11 countries found that positive peer relationships explained 33-40% of the variance in academic achievement (Roseth, Johnson & Johnson, 2008). Studies show that students' social competence and the quality of their friendship networks are predictive of academic achievement (Caprara et al., 2000; Wentzel & Caldwell, 1997). Research has also suggested that the quality of teacher–student relationships influences student learning outcomes (Cornelius-White, 2007; Hattie, 2009). Other data suggest that children with positive teacher–student relationships get better grades, have more positive attitudes toward school, are more engaged in the learning that occurs in the classroom, and are less likely to repeat a grade (Birch & Ladd, 1997; Hamre & Pianta, 2001). Students who believe that their teachers care about them are more motivated to try hard, to pay attention in class, and to do well; they are more likely to perform well and stay in school rather than drop out (Benard, 2004; Pianta, 1999; Sztejnberg, den Brok, & Hurek., 2004; Wentzel 1997).

Social Emotional Learning (SEL) is a growing educational field which teaches students skills that enable them to better identify their goals, manage their emotions, enhance their personal relationships, and increase school performance (Greenberg et al., 2003). Examples of these skills include emotional recognition, emotional management, effective communication, decision making, goal setting, empathy, and problem solving (Payton et al., 2008). Although SEL programs have prematurely started to permeate thousands of schools in dozens of countries, the methodologies to assess these programs have not used rigorous experimental designs.

Using existing longitudinal data, a meta-analysis of SEL programs in 213 schools with over 200,000 students showed that the programs have had significant effects on

different student outcomes. On average, students' grades increased by 11 percent, prosocial behaviors increased by 9 percent, adolescent depression and anxiety decreased by 9 percent, and behavioral issues decreased by 9 percent (Payton et al., 2008). Even though, given the large sample sizes in these studies, these effects were all significant, it is difficult to assess the causal effects of SEL programs, since these studies were not controlled experiments. Furthermore, they were missing some key data (e.g., standard deviations of outcome variables) to convert the reported percentage changes to actual effect sizes (Cohen's d) and be able to assess whether the increases in academic performance are relatively small, medium, or large.

Establishing Causality between Well-being and Academic Performance

Prior to the three studies we present, the causal relationship between well-being and academic achievement had yet to be adequately examined and established. To our knowledge, no large-scale randomized experimental designs had established experimental causality between different domains of youth well-being and academic performance. Other methods have approximated causality. Using hierarchical linear modeling of longitudinal data, personality researchers have suggested a causal relationship between self-control and academic achievement (Duckworth, Tsukayama, & May, 2010). Even though these statistical methods have allowed researchers to get closer to causality than previous longitudinal analyses, the study from where the data emerged did not have a control condition – participants were not randomly assigned to a treatment or a control condition, since personality is not easily manipulated; rather, each subject statistically serves as her own control using time-varying covariates. We claim that data

from controlled experimental designs can better establish causal relationships than hierarchical linear modeling of longitudinal quasi-experimental data.

Our randomized controlled trials (RCTs) in Bhutan, Mexico, and Peru were driven by the paucity of research on the causal relationship between well-being and academic performance. This is a surprising research gap in the fields of development psychology and positive psychology. Secondly, our studies empirically answered a perennial question: is teaching well-being in schools at a large scale not only desirable but also feasible? In the following three studies, we taught well-being skills on a large scale to school adolescents in Bhutan, Mexico, and Peru to experimentally answer the latter millennial question and to fill an important research gap in the adolescent positive development literature.

Study 1: Education for Gross National Happiness in Bhutan

As mentioned before, interventions with the goal of increasing youth well-being in schools are likely more effective when they are not limited to one classroom, but rather when they permeate all facets of an educational institution – students, teachers, staff, leadership, existing academic subjects, and extra-curricular activities (Weare, 2000). Bhutan provided such an enabling setting.

Bhutan is a small Himalayan country with fewer than one million inhabitants, and it uses Gross National Happiness (GNH) rather than Gross Domestic Product (GDP) to assess national progress and to drive public policy (Ura & K. Galay, 2004). The GNH index includes nine domains of progress: health, time use, education, cultural resilience, living standards, ecological diversity, good governance, community vitality, and

psychological well-being. In line with this, Bhutan has organized its education system around the principles of GNH; the Bhutanese Ministry of Education's explicit mission is to "Educate for Gross National Happiness."

The GNH Curriculum Experiment.

The Bhutanese Ministry of Education invited us to co-develop a *GNH Curriculum* that targets ten non-academic "life skills" for secondary school students (grades 7 through 12):

1. Mindfulness: calm awareness of thoughts, emotions, and surroundings
2. Empathy: identifying what other individuals are feeling or thinking
3. Self-awareness: understanding of personal talents, strengths, limitations, and goals
4. Coping with emotions: identifying, understanding, and managing emotions
5. Communication: being active and constructive in inter-personal communication
6. Interpersonal relationships: fostering healthy interactions with friends and family
7. Creative thinking: developing ideas that are novel and useful
8. Critical thinking: conceptualizing, applying, analyzing, synthesizing, and/or evaluating information as a guide to beliefs and actions
9. Decision making: choosing the best beliefs or action plans from available options
10. Problem solving: accessing effective heuristics to solve theoretical and practical problems

The curriculum teaches these skills in a 15-month stand-alone course called Life Skills Training. The curriculum also infuses these skills into existing academic subjects.

We tested two hypotheses: (1) Does the *GNH Curriculum* increase well-being? and, (2) Does increasing well-being improve academic performance?

Methods

The study included 18 public secondary schools in three representative *dzongkhags* (districts) in Bhutan: Thimphu, Punakha, and Wangdue Phodrang. 95% of Bhutanese students attend public schools and the language of instruction in Bhutan is English.

The study used a nested cluster randomized design at the whole-school level in 18 Bhutanese secondary schools (8,385 students). We randomly assigned the schools to either the treatment group, which received the *GNH Curriculum* during 15 months, or to the control group, which received a placebo *GNH Curriculum* during the same 15 months. We included a placebo Curriculum for the control group to control for demand artifacts in our results, such as the Hawthorne Effect or the Pygmalion Effect, which have been reliably documented in the literature of longitudinal studies in education and other fields (Adair, 1984; Parsons, 1974; Rosenthal & Jacobson, 1968; Rosenthal 1973). 11 schools (n=5,247 students) were in the treatment group, and 7 schools (n=3,138) were in the control group. The mean student age was 15.1 years old (SD 2.2, min 10, max 24). 54% of students were female.

This was a single blind study – students, teachers, and school staff were unaware of whether they were part of the treatment or control group. Throughout the intervention, only two researchers from the University of Pennsylvania and nine staff members from Bhutan's Ministry of Education were aware of which school was in which group.

The principals and teachers from both groups of schools were told that they were being trained to teach the *GNH Curriculum* and that they would be delivering a 15-month Life Skills Course aimed at increasing student well-being. A "Director of GNH" with

training in education was recruited and trained for each school; these Directors were also blind and did not know in which group their school was. The Director of GNH ensured that the curriculum was faithfully implemented throughout the 15-month intervention. The students in both groups of schools received the same number of classroom hours during the real 15-month Life Skills Course and the placebo 15-month Life Skills Course: two hours per week.

All principals and teachers from the 11 treatment schools received training during a 10-day *GNH Curriculum* retreat. The trainers were psychologists from the University of Pennsylvania and nine trained staff members from Bhutan's Ministry of Education; a training manual (*Educating for GNH*) was used. The trainers taught principals and teachers how to practice and how to teach the ten life skills (see Supplementary Materials for sample excerpts of curricula). Teachers were also trained to infuse their academic subjects (e.g., math, science, reading) with the ten life skills. Literature, for instance, was taught through a "GNH lens" by identifying strengths and virtues in characters from novels and by encouraging students to use these strengths in their daily lives. Further, all students in the intervention group participated in botany practices in organic gardens in every one of the 11 school campuses. They learned to plant, grow, and harvest vegetables and other foods. By studying the plants' physiology, genetics, ecology, classification, structure, and economic importance, students learned how to interactively apply what they were learning in their biology, chemistry, physics, and mathematics classes to their botanic practices. Furthermore, through the complex process of growing different plants with their fellow students and understanding the role of food in the larger local and

national economic system, students learned to practice critical thinking, creative thinking, decision making, and problem solving skills.

In the classroom, teachers learned how to give students verbal and written feedback in a way that empowered and motivated them to enhance the quality of their work. Teachers learned the importance of identifying and noting what students were doing right in their classwork, instead of only highlighting what they were doing wrong, which is typical of pedagogical practices in most secondary schools. The 11 schools in the treatment group implemented the *GNH Curriculum* from June 2012 to August 2013.

The principals and teachers from the 7 schools in the control group received training during a four-day placebo *GNH Curriculum* retreat during which they learned about how to teach nutrition, psychology, and human anatomy. The trainers in this retreat were the same as the trainers in the *GNH Curriculum* retreat for the treatment group. The 7 schools in the control group implemented the placebo *GNH Curriculum* from June 2012 to August 2013. The placebo curriculum covered the principles of nutrition, psychology, and human anatomy as part of a 15-month Life Skills Course that was taught to all students at each of these 7 schools.

Data Collection

We determined the number of schools and students to be included in the study by doing a two-level cluster power analysis before data collection. We decided to collect data from all students in the 18 secondary schools to maximize our statistical power. Using a significance cut-off of $p<0.05$, our power analysis revealed that 18 schools and 6,000 students nested within the schools would allow us to detect the effects of our

intervention on well-being or academic achievement if the effect sizes were as low as 0.20 standard deviations (a small effect size).

The student well-being survey used the validated EPOCH measure of adolescent well-being. The instrument's 20 items reliably assess engagement, perseverance, optimism, connectedness, and happiness, or EPOCH (Kern et al., 2015). In the EPOCH measure of well-being, Cronbach's α varies from $\alpha = .75$ for engagement to $\alpha = .86$ for happiness. The survey also included an overall measure of life satisfaction, the 5-item adolescent Satisfaction with Life Scale ($\alpha = .86$; Diener, Emmons, Larsen, & Griffin, 1985; Gadermann, Schonert-Reichl, & Zumbo, 2010). The survey also included questions about age, gender, hometown, and social media use.

We collected baseline well-being data from all students in the 18 secondary schools (n=8,385) during May 2012, the month before introducing the *GNH Curriculum*. We collected well-being data again at the end of the intervention, in September 2013 (n=7,363, participation rate = 99%). Students in grade 7 did not complete surveys in September 2013, since they were in primary school during baseline data collection. We collected well-being data a third time in September 2014, 12 months after the end of the intervention (n=6,524, participation rate = 99%). Students in grades 7 and 8 did not complete surveys in September 2014, since they were in primary school during baseline collection. Only data from students who completed all three rounds of data collection were included in this study (n=6,524).

In addition to self-reported well-being measures, we had access to participating students' performance on annual standardized exams (the National Education Assessment

or NEA) from September 2011 (pre-intervention), September 2013 (immediately post-intervention), and September 2014 (12 months after the end of the intervention). The NEA assesses students on math, science, and reading and is administered annually in September by the Ministry of Education to all students in both primary and secondary public schools in Bhutan. The NEA was created in 2003 in collaboration with the Organization for Economic Cooperation and Development (OECD). The NEA contains adapted versions of the items that the OECD uses in its Program for International Student Assessment (PISA) so that they are culturally sensitive and relevant to students' grade level (Ray & Margaret, 2003). PISA has become a global gold-standard to assess how countries rank in terms of their students' academic performance. The NEA has been tested in conjunction with the OECD for validity and reliability (Maxwell, Rinchen, & Cooksey, 2010).

One of our team members visited each of the 18 schools at least once per month and took extended notes on how the actual *GNH Curriculum* or placebo *GNH Curriculum* were being implemented. After the end of the intervention, we created a program evaluation checklist to measure treatment fidelity in the five domains that best practices dictate for longitudinal outcome studies: study design, training, delivery, receipt, and enactment (Moncher & Prinz, 1991; Smith, Daunic, & Taylor, 2007). We translated our qualitative notes into quantitative fidelity treatment data using this methodology retroactively (checklist in supplemental materials).

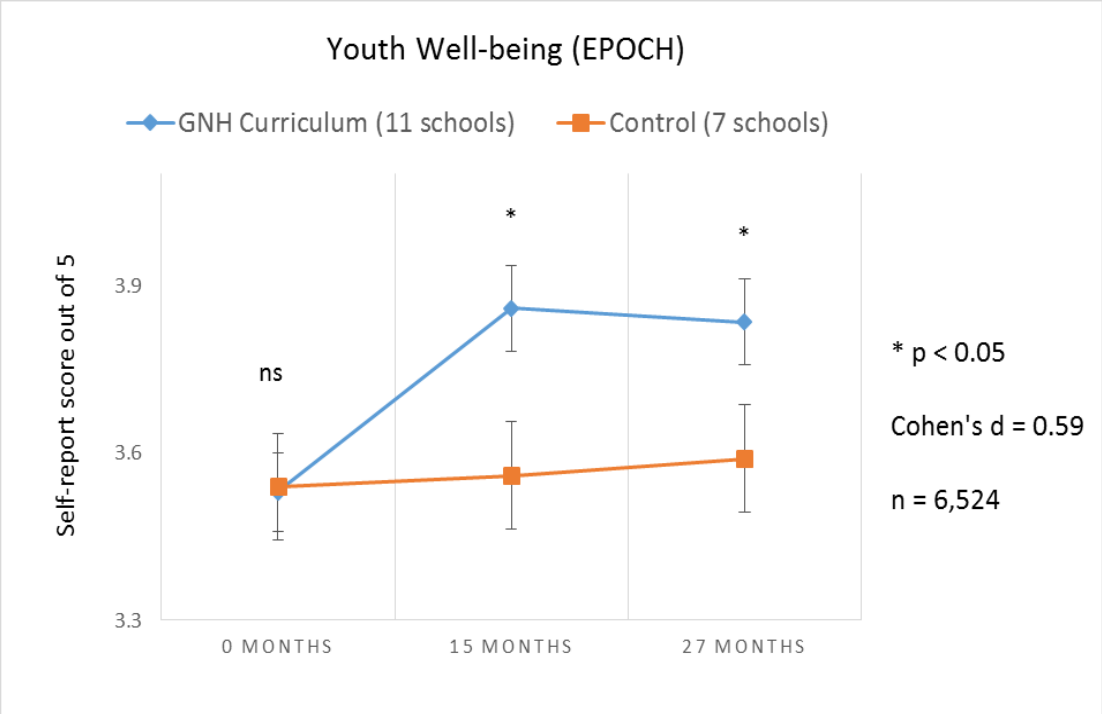
Following the University of Pennsylvania's Institutional Review Board (IRB) regulations for underage participants ("vulnerable populations") and sensitive data, all well-being and academic performance data were stored in secure hard drives housed at

the Ministry of Education in Bhutan. Furthermore, all students in the study were assigned unique identifying numbers. Only two staff members from the Bhutanese Ministry of Education had access to both student names and their unique identifiers, so data were de-identified to researchers from the University of Pennsylvania. Throughout the study, University of Pennsylvania researchers remotely accessed all raw data through a secure server for data analyses.

Results

The *GNH Curriculum* significantly increased student well-being. As illustrated in Figure 1, longitudinal school-level analyses of survey data from May 2012 and September 2013 indicate that the *GNH Curriculum* significantly increased adolescent well-being (as measured by the EPOCH scale) in treatment schools, compared to control schools (*Cohen's d* = 0.59, $t(16) = 3.54$, $P=0.002$). Intra-class correlation for students nested within schools was 0.13. The difference in adolescent well-being between schools in the control condition and the treatment condition *before* the GNH Curriculum intervention was not significant ($d = 0.01$, $t(16) = 0.17$, $P>0.250$). Furthermore, survey data from September 2014 (12 months after the end of the intervention) show that there was no significant decrease in well-being in treatment schools one year after the intervention ended ($d = 0.05$, $t(16) = 0.29$, $P>0.250$). The difference between treatment schools and control schools remained significant ($d = 0.54$, $t(16) = 3.41$, $P=0.004$).

Figure 1

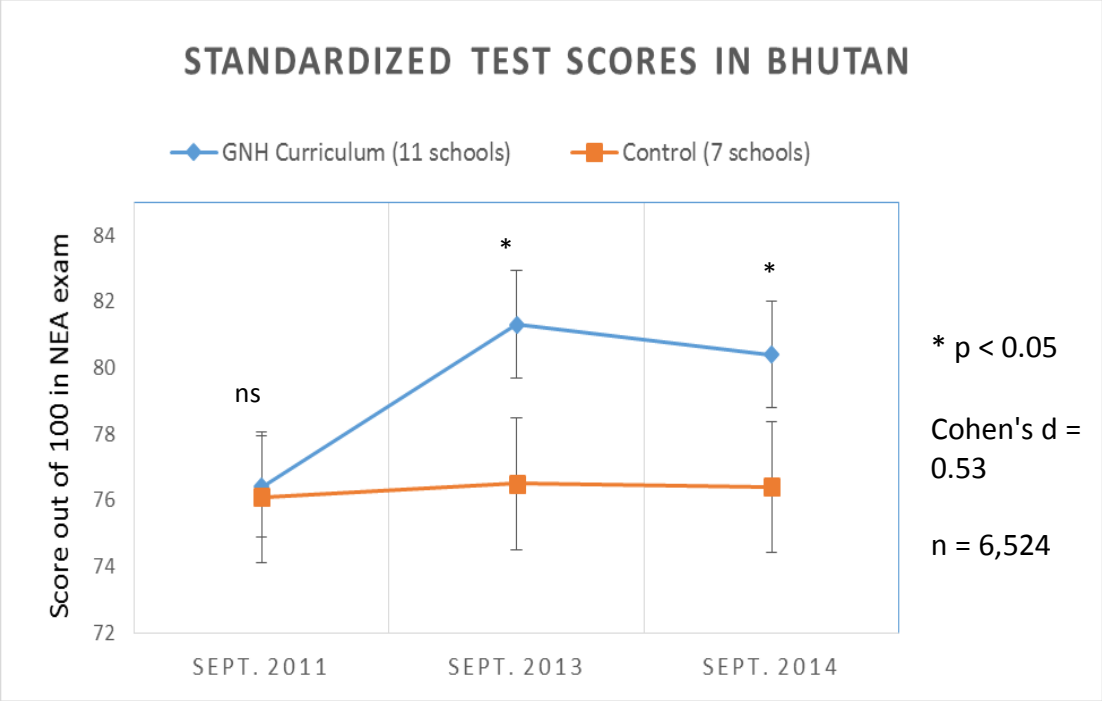


The *GNH Curriculum* significantly increased adolescent well-being in treatment schools, compared to control schools. In treatment schools, the mean EPOCH score before the intervention was 3.51 (SD 0.56, min 1, max 4.95), the mean EPOCH score after the intervention was 3.86 (SD 0.58, min 1, max 5), and the mean EPOCH score 12 months after the end of the intervention intervention was 3.83 (SD 0.57, min 1, max 5). In control schools, the mean EPOCH score before the intervention was 3.50 (SD 0.59, min 1, max 5), the mean EPOCH score after the intervention was 3.52 (SD 0.60, min 1, max 5), and the mean EPOCH score 12 months after the end of the intervention intervention was 3.54 (SD 0.60, min 1, max 5).

The *GNH Curriculum* substantially and significantly increased academic performance. As illustrated in Figure 2, longitudinal school-level analyses of standardized test scores from September 2011 and September 2013 showed that the GNH Curriculum increased academic achievement significantly in treatment schools, compared to control schools (*Cohen's d* = 0.53, $t(16) = 2.37$, P=0.031). Intra-class correlation for students nested within schools was 0.09. The difference in standardized test scores between schools in the control condition and the treatment condition *before* the GNH Curriculum intervention was not significant ($d = 0.06$, $t(16) = 0.14$, P>0.250).

Furthermore, standardized exam data from September 2014 (12 months after the end of the intervention) show that there was no significant decrease in students' performance in treatment schools one year after the intervention ended ($d = 0.12$, $t(16) = 0.41$, $P>0.250$). The difference between treatment schools and control schools remained significant ($d = 0.48$, $t(16) = 2.24$, $P<0.040$).

Figure 2



The *GNH Curriculum* significantly increased academic performance. In treatment schools, the mean exam score during September 2011 (before the intervention) was 76.1 (SD 9.25, min 15, max 100), the mean exam score during September 2013 (after the intervention) was 80.6 (SD 9.41, min 18, max 100), and the mean exam score during September 2014 (12 months after the end of the intervention) was 80.0 (SD 9.43, min 16, max 100). In control schools, the mean exam score during September 2011 was 76.0 (SD 9.65, min 14, max 100), the mean exam score during September 2013 was 76.1 (SD 9.63, min 12, max 100), and the mean exam score during September 2014 was 76.1 (SD 9.62, min 17, max 100).

An upward shift of 0.53 standard deviations (SDs) in standardized exam performance means that, on average, students who were performing at the 50th percentile before the intervention performed at the level of students in the 60th percentile after the 15-month intervention. That is roughly equivalent to a gain of a full academic year.

Multivariate stepwise linear modeling of academic achievement at time t1, using academic achievement at time t0 and different dimensions of well-being as predictors, revealed three well-being factors as the strongest predictors of increased performance on standardized test scores, controlling for academic performance at time t0: more

engagement, more perseverance, and higher connectedness (all as measured by the EPOCH survey instrument).

Academic performance at time t0 accounts for 0.58 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining variance of 0.42, 0.063 is explained by changes in student engagement from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 15.1% of the remaining variance. We controlled for the other four factors in the EPOCH measure by including them in a second stepwise linear model, and then adding only the change in engagement factor in the third stepwise linear model. For clarity purposes, in the Tables beyond Table 1, we eliminated the second step with four EPOCH factors, and instead included only the variance in academic performance that the change in a fifth factor alone (e.g., perseverance, connectedness) contributed to changes in academic performance between t0 and t1.

Table 1

From a three-step to a two-step stepwise linear regression model

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.76[a]	.58	.58	2.59	.58	.000
2	.83[b]	.69	.68	2.45	.11	.000
3	87[c]	.75	.74	2.42	**.063**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_epoch (minus engagement)

c. Predictors: (Constant), Academic performance t0, delta_engagement

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.76[a]	.58	.58	2.59	.58	.000
2	.80[b]	.65	.64	2.45	**.063**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_engagement

Academic performance at time t0 accounts for 0.58 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.42 of the variance, **0.063** is explained by changes in student engagement from time t0 to time t1 (controlling for the other four factors of EPOCH, as shown in the first of two tables above), which corresponds to 15.1% of the remaining variance. These two models are statistically significant ($p<0.0001$).

Of the remaining variance of 0.42 not explained by academic performance at time t0, 0.075 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 18.0% of the remaining variance.

Table 2

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.76[a]	.58	.58	2.59	.58	.000
2	.81[b]	.66	.65	2.42	**.075**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_perseverance

Academic performance at time t0 accounts for 0.58 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.42 of the variance, 0.075 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 18.0% of the remaining variance. These two models are statistically significant ($p<0.0001$).

0.068 of the remaining 0.42 variance is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 16.3% of the remaining variance.

Table 3

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.764[a]	.584	.579	2.5916	.584	.000
2	.807[b]	.652	.648	2.4394	**.068**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_connectedness

Academic performance at time t0 accounts for 0.58 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.42 of the variance, 0.068 is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 16.3% of the remaining variance. These two models are statistically significant ($p<0.0001$).

Changes in optimism and happiness accounted for marginal amounts of the remaining variance in academic achievement at time t1 (2% and 3%, correspondingly).

Our retrospective treatment fidelity analyses indicated that, throughout the 15-month intervention period, there was 87% treatment fidelity in the 11 schools that received the *GNH Curriculum* and 74% treatment fidelity in the 7 control schools that

received the placebo *GNH Curriculum*. An 87% treatment fidelity means that when we retrospectively completed, the treatment fidelity 5-item checklists for the treatment schools, in aggregate, 87% of the total boxes were checked off (5 boxes per school visit – see Supplementary Materials for details). Analogously, a 74% treatment fidelity means that we retroactively checked off 74% of the boxes in the checklist for the control schools when we compared teachers', trainers', and researchers' notes against the 5-item checklist. Both of these are acceptable treatment fidelity rates, according to best practices in longitudinal outcome studies related to physical and psychological health (Song, Happ, & Sandelowski, 2010).

Our RCT revealed the sustained effect of the *GNH Curriculum* on both well-being and on academic performance. Following our field experiment's positive results, Bhutan's Ministry of Education has decided to take the program to a national scale and is currently on a path to implement the curriculum in every public secondary school in the country.

Study 2: *Educación para el Bienestar* in Jalisco, Mexico

Jalisco is one of 32 states in Mexico. It has a population of about eight million people, and it has a relatively high level of economic development, compared to other states in Mexico. Since campaigning for public office in 2012, the current governor of Jalisco, Aristoteles Sandoval, declared it his mandate to make the state of Jalisco Mexico's first state of well-being (*bienestar*). Since starting his tenure as Governor on March 1st, 2013, Governor Sandoval has initiated a constellation of public policies to promote well-being. Together with health and infrastructure, education has been one of

three foci for his government's budget allocation in policy design and implementation (Reyes-Robles & Gómez-Hernández, 2013).

Under the jurisdiction of Jalisco's Ministry of Education is the *Colegio de Estudios Científicos y Tecnológicos del Estado de Jalisco (CECYTEJ)*, or College of Science and Technology Studies of the State of Jalisco. CECYTEJ consists of 70 public secondary schools with a particular focus on science and technology. We partnered with Jalisco's Ministry of Education to conduct a Positive Education RCT with CECYTEJ's 70 schools, and pending a positive impact evaluation, the Ministry of Education would take the program to a state-wide scale.

Educación para el Bienestar **Program**

After a number of structured focus groups with CECYTEJ principals, teachers, students, and parents, we found that the program name that was most contextually and culturally relevant was *Educación para el Bienestar*, or Education for Well-being. The curriculum for this program, the *Currículum de Bienestar*, or Well-being Curriculum, had analogous focus areas to the GNH Curriculum in Bhutan:

1. *presencia plena* (full presence)
2. *autoconocimiento* (self-knowledge)
3. *comprensión y manejo de emociones* (emotional comprehension and management)
4. *empatía y altruism* (empathy and altruism)
5. *ejercicio físico* (physical exercise)
6. *resiliencia* (resilience)
7. *pensamiento crítico* (critical thinking)
8. *toma de decisions* (decision-making)
9. *comunicación* (communication)
10. *pensamiento creativo* (creative thinking)

Even though the life skills that we taught during the RCT were analogous to those in the GNH Curriculum in Bhutan, the content and structure of the curriculum was fully adapted so that it resonated with the context and culture of local principals, teachers, and students. The *Currículum de Bienestar* was co-developed with local principals and teachers from non-CECYTEJ schools (to ensure a single-blind study) as well as with staff trained in curricular design from Jalisco's Ministry of Education.

Methods

The study included all 70 CECYTEJ upper-secondary schools (grades 10 to 12) from across the state of Jalisco. The language of instruction in all of these schools is Spanish.

The study used a nested cluster randomized design at the whole-school level in 70 public secondary schools (68,762 students). We randomly assigned the schools to either the treatment group, which received the *Bienestar Curriculum* during 15 months, or to the control group, which received a placebo *Bienestar Curriculum* during the same 15 months. 35 schools (m = 35,568 students) were in the treatment group, and 35 schools (m = 33,194 students) were in the control group. The mean student age was 16.2 years old (SD 1.1, min 13, max 26). 52% of students were female.

This was a single blind study – students, teachers, principals and school staff were unaware of whether they were part of the treatment or control group. Throughout the intervention, only researchers from the University of Pennsylvania and staff members from Jalisco's Ministry of Education were aware of which school was in which group.

35 trainers with a background in psychology or education received training during a 10-day *Bienestar Curriculum* retreat. The trainers who trained local trainers were psychologists from the University of Pennsylvania and trained staff members from Jalisco's Ministry of Education. We used a training manual also named *Educación para el Bienestar*. The trainers taught local trainers both how to practice the ten life skills and how to teach them to principals and teachers. Local trainers were also trained on how to teach teachers how to infuse their academic subjects (e.g., math, reading, science) with the ten life skills. Local trainers taught the *Bienestar Curriculum* to teachers and principals in the 35 schools in the treatment group during the 2 weeks in August 2014 before the start of the 2014/2015 academic year. Local trainers, principals, and teachers in the 35 schools in the treatment group implemented the *Bienestar Curriculum* from August 2014 to December 2015.

The 35 local trainers for the 35 schools in the control group received training during a four-day placebo *Bienestar Curriculum* retreat during which they learned how to teach nutrition, psychology, and human anatomy to teachers and principals. The trainers who trained local trainers in this retreat were the same as the trainers who trained local trainers in the *Bienestar Curriculum* retreat for the treatment group. Local trainers taught the placebo *Bienestar Curriculum* to teachers and principals in the 35 schools in the control group during one week in August 2014 before the start of the 2014/2015 academic year. Local trainers, teachers, and principals in the 35 schools in the control group implemented the placebo *Bienestar Curriculum* from August 2014 to December 2015. The placebo curriculum covered the principles of nutrition, psychology, and human

anatomy as part of a 15-month *Curso de Habilidades para la Vida*, or Life Skills Course that was taught to all students at each of these 35 schools.

The principals and teachers from both groups of schools were told that they were being trained by local trainers to teach the *Bienestar Curriculum* and that they would be delivering a 15-month Life Skills Course aimed at increasing student well-being. A *Director de Bienestar* (Well-being Director) with training in education was recruited and trained for each school; these Directors were also blind and did not know in which group their school was. The *Directores de Bienestar* ensured that the curriculum was faithfully implemented throughout the 15-month intervention. The students in both groups of schools received the same number of classroom hours during the real 15-month Life Skills Course and the placebo 15-month Life Skills Course: two hours per week.

Data Collection

Baseline data collection during August 2014 and post-intervention data collection during December 2015 for this second study was similar in content to data collection for Study 1 in Bhutan. However, during August 2014 we did not collect data from students in grade 12, since they would have graduated by the end of the intervention and we would not have access to them during post-intervention measurement. We only collected data from students in grades 10 and 11. In Jalisco, we used the Mexican Spanish-version of the EPOCH well-being survey. With professional translators, we used the international gold standard for translation-reverse translation of instruments for cross-cultural research, the Brislin process, to get a reliable version of the validated EPOCH instrument in the Spanish used in that region of Mexico (Brislin, 1970). We were also given access to the

students' national standardized test scores from February 2014 (pre-intervention) and from February 2016 (post-intervention). During the end of 2014, the *Evaluación Nacional de Logro Académico en Centros Escolares* (ENLACE) national standardized exam was renamed the *Plan Nacional para la Evaluación de los Aprendizajes* (PLANEA). ENLACE and PLANEA assess secondary school students in the areas of mathematics and reading comprehension, using internationally recognized best assessment strategies (Gallardo-Gomez, 2000; Hamodi, López Pastor, & López Pastor, 2015; Sánchez Zúñiga, 2009). The overall student participation rate in data collection was 95%. We had access to students' scores on the ENLACE standardized exam before the beginning of the August 2014 intervention and on the PLANEA standardized exam after December 2015.

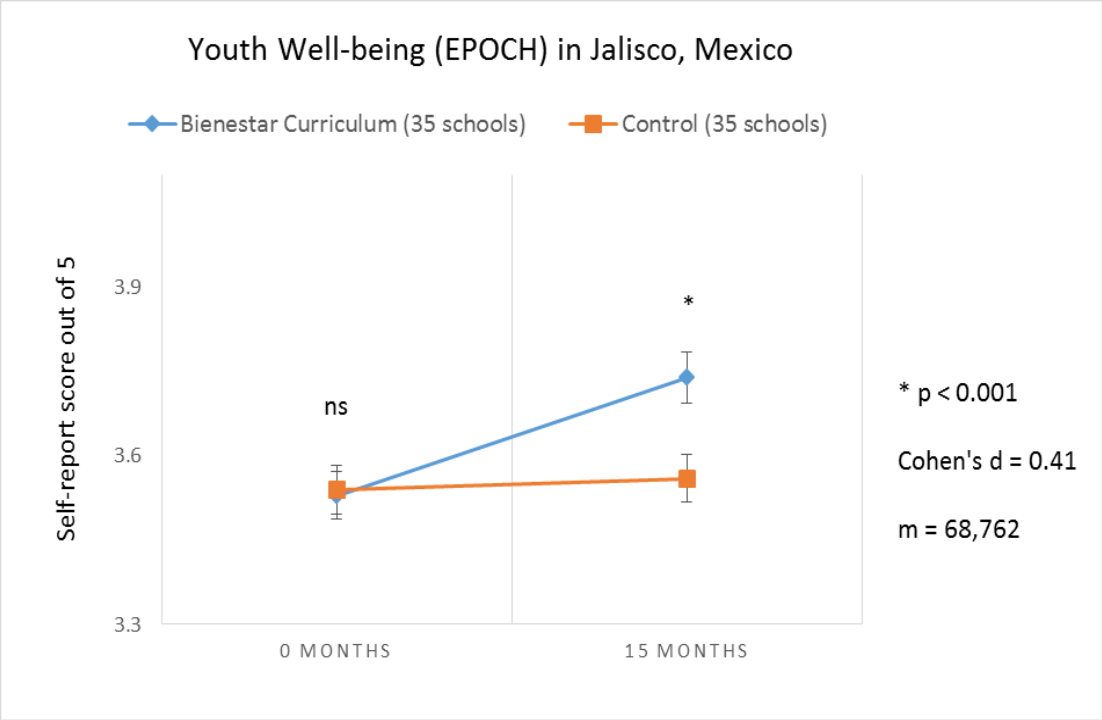
Local trainers in Jalisco visited each of the 70 schools at least once per week to measure treatment fidelity using an adapted evaluation checklist in the five domains that best practices dictate for longitudinal outcome studies: study design, training, delivery, receipt, and enactment (Moncher & Prinz, 1991; Smith, Daunic, & Taylor, 2007; Song, Happ, & Sandelowski, 2010).

Following IRB regulations, all well-being and academic performance data were stored in secure hard drives housed at the Ministry of Education in Jalisco. Furthermore, all students in the study were assigned unique identifying numbers. Only two staff members from Jalisco's Ministry of Education had access to both student names and their unique identifiers, so data were de-identified to researchers from the University of Pennsylvania. Throughout the study, University of Pennsylvania researchers remotely accessed all raw data through a secure server for data analyses.

Results

The *Bienestar Curriculum* significantly increased student well-being. As illustrated in Figure 3, longitudinal school-level analyses of survey data from August 2014 and December 2015 indicate that the *Bienestar Curriculum* significantly increased adolescent well-being (as measured by the Spanish-version of the EPOCH scale) in treatment schools, compared to control schools (*Cohen's d* = 0.41, $t(68) = 3.01$, $P<0.001$). Intra-class correlation for students nested within schools was 0.16. The difference in adolescent well-being between schools in the control condition and the treatment condition *before* the GNH Curriculum intervention was not significant ($d = 0.03$, $t(68) = 0.32$, $P>0.250$).

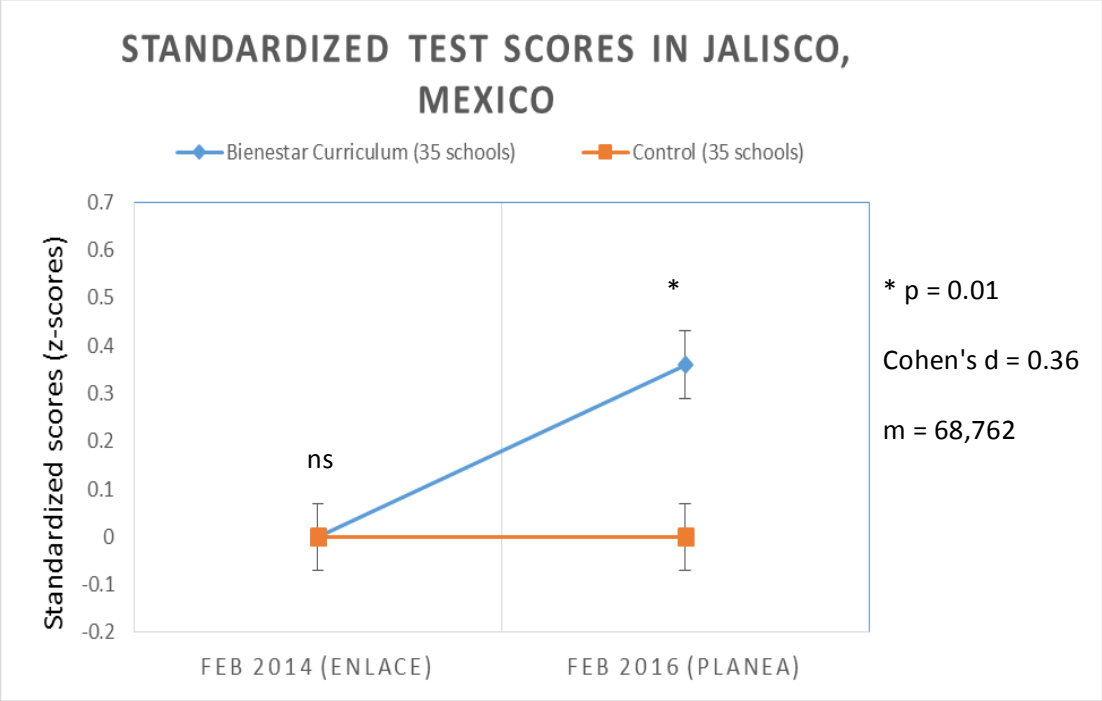
Figure 3



The *Bienestar Curriculum* significantly increased adolescent well-being in treatment schools, compared to control schools. In treatment schools, the mean EPOCH score before the intervention was 3.53 (SD 0.51, min 1, max 5) and the mean EPOCH score after the intervention was 3.74 (SD 0.53, min 1, max 5). In control schools, the mean EPOCH score before the intervention was 3.54 (SD 0.56, min 1, max 5) and the mean EPOCH score after the intervention was 3.56 (SD 0.55, min 1, max 5).

The *Bienestar Curriculum* substantially and significantly increased academic performance. As illustrated in Figure 4, longitudinal school-level analyses of standardized test scores from February 2014 and February 2016 showed that the *Bienestar Curriculum* increased academic achievement significantly in treatment schools, compared to control schools (*Cohen's d* = 0.36, $t(68) = 2.61$, P=0.01). Intra-class correlation for students nested within schools was 0.12. The difference in standardized test scores between schools in the control condition and the treatment condition *before* the GNH Curriculum intervention was not significant (d = 0.02, $t(68) = 0.18$, P>0.250).

Figure 4



The *Bienestar Curriculum* significantly increased academic performance. Since the national standardized exam in Mexico changed from ENLACE before our intervention to PLANEA after our intervention, we converted all of our participants' scores into z-scores. In treatment schools, the mean exam score z-score during February 2014 (before the intervention) was -0.01 (SD 1) and the mean exam z-score score during February 2016 (after the intervention) was 0.36 (SD 1.02). In control schools, the mean exam z-score score during February 2014 was 0.00 (SD 1) and the mean exam z-score score during February 2016 was 0.01 (SD 1).

Multivariate stepwise linear modeling of academic achievement at time t1, using academic achievement at time t0 and different dimensions of well-being as predictors, revealed three well-being factors as the strongest predictors of increased performance on standardized test scores, controlling for academic performance at time t0: higher connectedness, more perseverance, and more engagement (all as measured by the EPOCH survey instrument). These were the same three factors from Study 1 in Bhutan.

Academic performance at time t0 accounts for 0.64 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.36

variance, 0.057 is explained by changes in student engagement from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 15.8% of the remaining variance.

Table 4

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.80[a]	.64	.64	1.45	.64	.000
2	.84[b]	.70	.69	1.42	**.057**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_engagement

Academic performance at time t0 accounts for 0.64 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.36 of the variance, 0.057 is explained by changes in student engagement from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 15.8% of the remaining variance. These two models are statistically significant ($p<0.0001$).

Of the remaining 0.36 variance, 0.073 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 20.2% of the remaining variance.

Table 5

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.80[a]	.64	.64	1.45	.64	.000
2	.85[b]	.71	.70	1.41	**.073**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_perseverance

Academic performance at time t0 accounts for 0.64 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.36 of the variance, 0.073 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 20.2% of the remaining variance. These two models are statistically significant ($p<0.0001$).

0.054 of the remaining variance is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 15.0% of the remaining variance.

Table 6
Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.80[a]	.64	.64	1.45	.64	.000
2	.83[b]	.69	.69	1.42	**.054**	.000

a. Predictors: (Constant), Academic performance t0
b. Predictors: (Constant), Academic performance t0, delta_connectedness

Academic performance at time t0 accounts for 0.64 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.36 of the variance, 0.054 is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 15.0% of the remaining variance. These two models are statistically significant ($p<0.0001$).

Changes in optimism and happiness accounted for marginal amounts of the remaining variance in academic achievement at time t1 (1.5% and 2.4%, correspondingly). Tables 4, 5, and 6 show the results of multivariate stepwise linear modeling.

Our treatment fidelity data indicate that there was 78% treatment fidelity in the 35 schools that received the *Bienestar Curriculum* and 67% treatment fidelity in the 35 control schools that received the placebo *Bienestar Curriculum*.

Study 3: *Escuelas Amigas* in Peru

Peru is a South American country with about 32 million inhabitants. Socioeconomically and culturally, it is similar to Mexico. During October 2013, the Peruvian Minister of Education, Jaime Saavedra, expressed interest in incorporating skills

for well-being into the country's national education curriculum. As a quantitative economist with a focus on experimental impact evaluations of public policy for social well-being and on asset-based approaches to poverty reduction (Attanasio et al, 2001; Ñopo, Saavedra-Chanduví, & Robles, 2007), Dr. Saavedra directed the Ministry's team to run a large-scale pilot RCT in the country before implementing a well-being curriculum at a national scale.

In November 2013, we were invited to partner with the Peruvian Ministry of Education and the World Bank to run the largest education RCT in the region's history. Minister Saavedra's goal was to choose 700 representative schools from Peru and to randomly assign them to receive a novel curriculum with a well-being focus or to receive a placebo control curriculum (to control for demand artifacts). We were invited to co-design the well-being curriculum and to advise on best well-being measurement instruments for adolescents and on experimental impact evaluation. The World Bank collected data throughout the project, and the Ministry of Education implemented the program.

Escuelas Amigas **Program**

Following qualitative focus groups with principals, teachers, students, and parents from some of the schools that would be in the program, we identified that the program name that most resonated with the local context and culture was *Escuelas Amigas*, or Friendly Schools. The curriculum for this program, the *Paso a Paso* Curriculum, or Step by Step Curriculum, had ten areas of focus that were analogous to those in the *Bienestar* Curriculum in Jalisco, Mexico, with lexicon slightly adapted to the Peruvian reality:

1. *atención plena* (full attention)
2. *autoconocimiento* (self-knowledge)
3. *manejo de emociones y estrés* (management of emotions and stress)
4. *empatía* (empathy)
5. *deporte* (sports)
6. *fortaleza mental y emocional* (mental and emotional strength)
7. *pensamiento crítico* (critical thinking)
8. *toma de decisions* (decision-making)
9. *comunicación efectiva* (effective communication)
10. *pensamiento creativo* (creative thinking)

Just like in Jalisco, Mexico, the content and structure of the curriculum was adapted so that it resonated with local principals, teachers, and students. We co-developed the *Paso a Paso* Curriculum with local principals and teachers as well as with staff trained in curricular development from Peru's Ministry of Education.

Methods

The study included 694 secondary schools from all over Peru (grades 7 – 12). We did not include students in grade 12 for our study, since they would have graduated by the end of the intervention and we would not have access to them during post-intervention measurements. The language of instruction in all of these schools is Spanish.

The study used a nested cluster randomized design at the whole-school level in 694 public secondary schools (q = 694,153 students). We randomly assigned the schools to either the treatment group, which received the *Paso a Paso* Curriculum during 15 months, or to the control group, which received a placebo *Paso a Paso* Curriculum during the same 15 months. 347 schools (q = 344,815 students) were in the treatment

group, and 347 schools (q = 349,338 students) were in the control group. The mean student age was 15.4 years old (SD 0.8, min 11, max 28). 53% of students were female.

This was a single blind study – students, teachers, principals and school staff were unaware of whether they were part of the treatment or control group. Throughout the intervention, only researchers from the University of Pennsylvania and staff members from Peru's Ministry of Education were aware of which school was in which group.

28 trainers with a background in psychology or education received training over a 10-day *Paso a Paso* Curriculum retreat. The trainers who trained local trainers were psychologists from the University of Pennsylvania and trained staff members from Peru's Ministry of Education; a training manual (*Escuelas Amigas*) was used. The trainers taught the 28 local trainers how to practice the ten life skills and how to teach them to other trainers as well as to principals and teachers. Local trainers were also trained on how to teach teachers how to infuse their academic subjects (e.g., math, reading) with the ten life skills, as well as on how to train other trainers to train teachers. The 28 local trainers taught the *Paso a Paso* Curriculum to 360 local trainers during three weeks in January and February 2014. The 360 local trainers then taught the *Paso a Paso* Curriculum to teachers and principals in the 347 schools in the treatment group during 2 weeks in February 2014, before the 2014 academic year started in March. Local trainers, principals, and teachers in the 347 schools in the treatment group implemented the *Paso a Paso* Curriculum from March 2014 to July 2015.

25 trainers received training during a four-day placebo *Paso a Paso* Curriculum retreat during which they learned about how to teach nutrition, psychology, and human

anatomy to teachers and principals as well as how to train other trainers. The trainers who trained the 25 local trainers in this retreat were the same as the trainers who trained local trainers in the *Paso a Paso* Curriculum retreat for the treatment group. The 28 local trainers taught the placebo *Paso a Paso* Curriculum to 230 local trainers during 10 days in February 2014. The 230 local trainers then taught the placebo *Paso a Paso* Curriculum to teachers and principals in the 347 schools in the control group during 7 days in February 2014. Local trainers, principals, and teachers in the 347 schools in the treatment group implemented the placebo *Paso a Paso* Curriculum from March 2014 to July 2015. The placebo curriculum covered the principles of nutrition, psychology, and human anatomy as part of a 15-month Life Skills Course (*Habilidades para la Vida)* that was taught to all students at each of these 347 secondary schools.

The principals and teachers from both groups of schools were told that they were being trained by local trainers to teach the *Paso a Paso* Curriculum and that they would be delivering a 15-month Life Skills Course aimed at increasing student well-being. A *Director de Bienestar* (Well-being Director) with training in education was recruited and trained for each school; these Directors were also blind and did not know in which group their school was. The *Directores de Bienestar* ensured that the curriculum was faithfully implemented throughout the 15-month intervention. The students in both groups of schools received the same number of classroom hours during the actual 15-month Life Skills Course and the placebo 15-month Life Skills Course: two hours.

Data Collection

We collected pre-intervention baseline data during March 2014 and post-intervention data during July 2015 for this third study. It was similar in content to data collection for Study 2 in Jalisco, Mexico, which included the Peruvian Spanish-version of the EPOCH well-being survey. We used the Brislin translation-reverse translation process to get a reliable version of the validated EPOCH instrument in the Spanish used in Peru (Brislin, 1970). We also got access to students' performance on the *Evaluación Censal de Estudiantes (ECE)*, the standardized exam in Peru, administered nationally every November before the end of the academic year. Using international standards for standardized testing, the ECE measures students' performance in mathematics and reading comprehension throughout primary and secondary school (Beltrán & Seinfeld, 2011; Näslund-Hadley, Norsworthy, & Thompson, 2010). The overall student participation rate in data collection was 93.2%. We had access to students' scores on the ECE exam from November 2013 (before the beginning of the March 2014 intervention) and from November 2015 (after the July 2015 end of the intervention).

Local trainers in Peru visited each of the 694 schools at least once per week to measure treatment fidelity using an adapted evaluation checklist in the five domains that best practices dictate for longitudinal outcome studies: study design, training, delivery, receipt, and enactment (Moncher & Prinz, 1991; Smith, Daunic, & Taylor, 2007; Song, Happ, & Sandelowski, 2010).

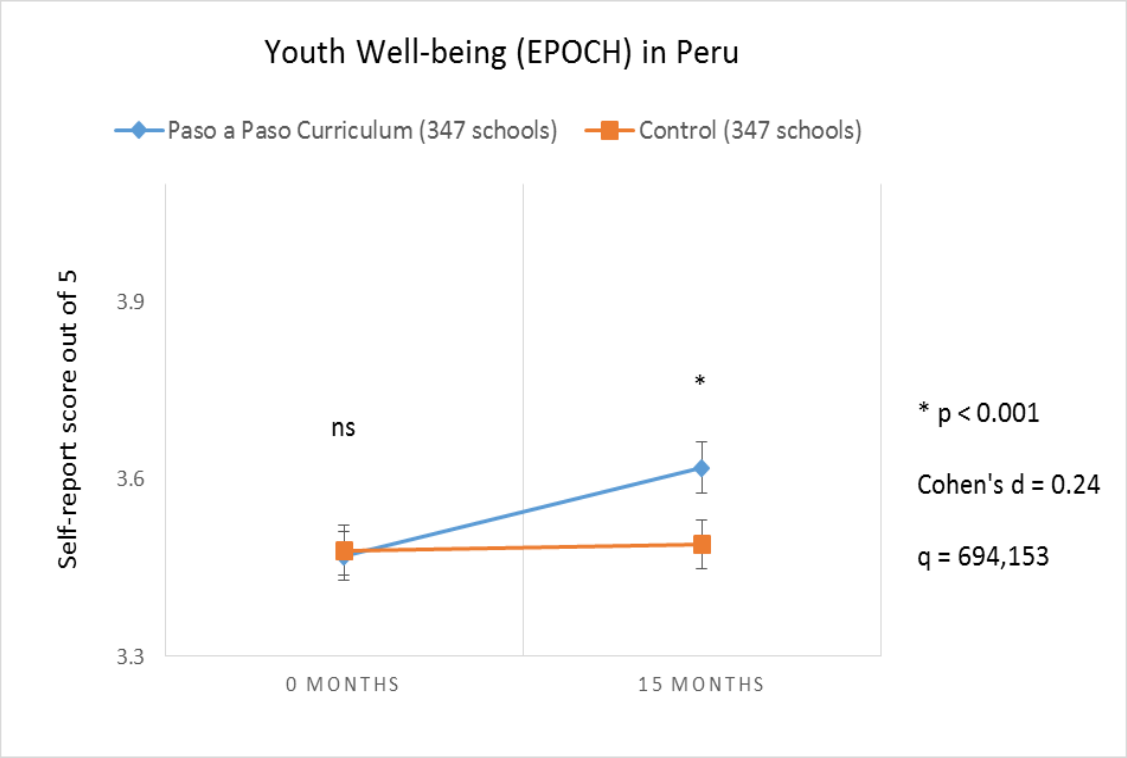
Following IRB regulations, all well-being and academic performance data were stored in secure hard drives housed at the Ministry of Education in Lima, Peru. Furthermore, all students in the study were assigned unique identifying numbers. Two staff members from Peru's Ministry of Education had access to both student names and

their unique identifiers, so data were de-identified to researchers from the University of Pennsylvania. Throughout the study, University of Pennsylvania researchers remotely accessed all raw data through a secure server for data analyses.

Results

The *Paso a Paso Curriculum* significantly increased student well-being. As illustrated in Figure 5, longitudinal school-level analyses of survey data from March 2014 and July 2015 indicate that the *Paso a Paso Curriculum* significantly increased adolescent well-being (as measured by the Peruvian Spanish-version of the EPOCH scale) in treatment schools, compared to control schools (*Cohen's d* = 0.24, $t(692) = 2.81$, $P=0.0043$). Intra-class correlation for students nested within schools was 0.18. The difference in adolescent well-being between schools in the control condition and the treatment condition *before* the GNH Curriculum intervention was not significant ($d = 0.01$, $t(694) = 0.25$, $P>0.250$).

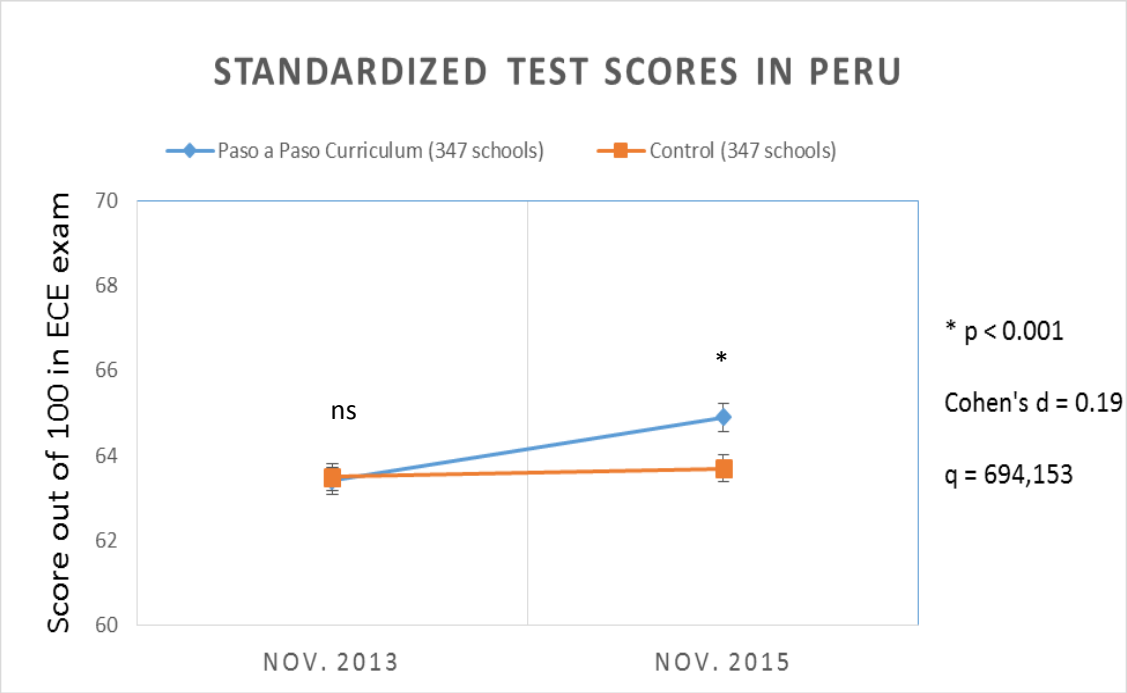
Figure 5



The *Paso a Paso Curriculum* significantly increased adolescent well-being in treatment schools, compared to control schools. In treatment schools, the mean EPOCH score before the intervention was 3.47 (SD 0.62, min 1, max 5) and the mean EPOCH score after the intervention was 3.62 (SD 0.63, min 1, max 5). In control schools, the mean EPOCH score before the intervention was 3.48 (SD 0.61, min 1, max 5) and the mean EPOCH score after the intervention was 3.49 (SD 0.61, min 1, max 5).

The *Paso a Paso Curriculum* significantly increased academic performance. As illustrated in Figure 6, longitudinal school-level analyses of test scores on the ECE from November 2013 and November 2015 showed that the *Paso a Paso Curriculum* increased academic achievement significantly in treatment schools, compared to control schools (*Cohen's d* = 0.19, $t(694) = 2.45$, P=0.014). Intra-class correlation for students nested within schools was 0.09. The difference in standardized test scores between schools in the control condition and the treatment condition *before* the intervention was not significant ($d = 0.01$, $t(694) = 0.11$, P>0.250).

Figure 6



The *Paso a Paso Curriculum* significantly increased academic performance. In treatment schools, the mean exam score during November 2013 (before the intervention) was 63.4 (SD 7.89, min 0, max 100) and the mean exam score during November 2015 (after the intervention) was 64.9 (SD 7.49, min 0, max 100). In control schools, the mean exam score during November 2013 was 63.5 (SD 7.45, min 0, max 100) and the mean exam score during November 2015 was 63.7 (SD 7.44, min 0, max 100).

Multivariate stepwise linear modeling of academic achievement at time t1, using academic achievement at time t0 and different dimensions of well-being as predictors, revealed the same three well-being factors as the strongest predictors of increased performance on standardized test scores as Studies 1 and 2, controlling for academic performance at time t0: higher connectedness, more perseverance, and more engagement (all as measured by the Peruvian Spanish version of the EPOCH survey instrument).

Academic performance at time t0 accounts for 0.62 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining variance of 0.38, 0.042 is explained by changes in student engagement from time t0 to time t1

(controlling for the other four factors of EPOCH), which corresponds to 11.1% of the remaining variance.

Table 7

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.79[a]	.62	.62	0.67	.62	.000
2	.81[b]	.66	.65	0.65	**.042**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_engagement

Academic performance at time t0 accounts for 0.62 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.38 of the variance, 0.042 is explained by changes in student engagement from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 11.1% of the remaining variance. These two models are statistically significant ($p<0.0001$).

0.053 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 13.9% of the remaining variance.

Table 8

Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.79[a]	.62	.62	0.67	.62	.000
2	.82[b]	.67	.66	0.64	**.053**	.000

a. Predictors: (Constant), Academic performance t0

b. Predictors: (Constant), Academic performance t0, delta_perseverance

Academic performance at time t0 accounts for 0.62 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.38 of the variance, 0.053 is explained by changes in student perseverance from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 13.9% of the remaining variance. These two models are statistically significant ($p<0.0001$).

0.037 is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 9.7% of the remaining variance.

Table 9
Model Summary (dependent variable: Academic performance t1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Sig. F Change
1	.79[a]	.62	.62	0.67	.62	.000
2	.81[b]	.65	.64	1.65	**.037**	.000

a. Predictors: (Constant), Academic performance t0
b. Predictors: (Constant), Academic performance t0, delta_connectedness

Academic performance at time t0 accounts for 0.62 of the variance in academic performance at time t1 for students in the intervention group. Of the remaining 0.38 of the variance, 0.037 is explained by changes in student connectedness from time t0 to time t1 (controlling for the other four factors of EPOCH), which corresponds to 9.7% of the remaining variance. These two models are statistically significant ($p<0.0001$).

Changes in optimism and happiness accounted for marginal amounts of the remaining variance in academic achievement at time t1 (1.1% and 1.4%, respectively). Tables 7, 8, and 9 show the results of multivariate stepwise linear modeling.

Our treatment fidelity data indicate that there was 71% treatment fidelity in the 347 schools that received the *Paso a Paso* Curriculum and 52% treatment fidelity in the 347 control schools that received the placebo *Paso a Paso* Curriculum.

Discussion

The curricula in Bhutan, Mexico, and Peru, designed to enhance student well-being, not only increased well-being, but they also significantly increased students' performance on national standardized exams. Taken together, our data demonstrate that well-being and academic achievement are not antagonistic, as some have suggested (Mayer & Cobb, 2000); on the contrary, teaching life skills consistently increased well-

being and academic achievement in different social, economic, and cultural contexts and at large scales.

Stepwise linear regressions revealed three potential mechanisms through which the curricula caused an increase in standardized test results. Controlling for academic performance before the intervention (time t0) in students who received the treatment curricula, perseverance was consistently the strongest predictor of post-intervention increases in academic performance (time t1). Connectedness and Engagement followed perseverance in being the strongest preditors of increases in academic performance.

Increases in the perseverance of students who received well-being curricula in the three studies accounted for a range of 13.9% in Peru to 20.2% of their increased post-intervention academic performance, controlling for performance on standardized exams at time t0. This finding is consistent with the existing psychological literature on self-control, grit, and academic achievement (Duckworth & Seligman, 2005).

Increases in the connectedness of students who received the intervention curricula accounted for 9.7% in Peru to 16.3% in Bhutan of their post-intervention increased academic performance, controlling for performance on standardized exams at time t0. Research suggests that having high-quality friendships, or at least one best friend, helps prevent children and adolescents from being bullied, a leading cause of social and emotional violence in schools (Bollmer, Milich, Harris, & Maras, 2005). Further, positive teacher-student relationships play an important role in students' resilience and academic performance (Marzano, 2003; Nadel & Muir, 2005; Raskauskas et al., 2010). In the classrooms in this study, for instance, both teachers and students soon learned that

adolescent learners did significantly more things right than they did wrong, and thus the fact that positive feedback became more frequent than negative feedback was a more accurate representation of students' academic performance and behavior. By experientially learning the skills of effective communication and empathy, the environment in classrooms changed from being rigid, dull, and hierarchical to more egalitarian, respectful, energetic, and motivating.

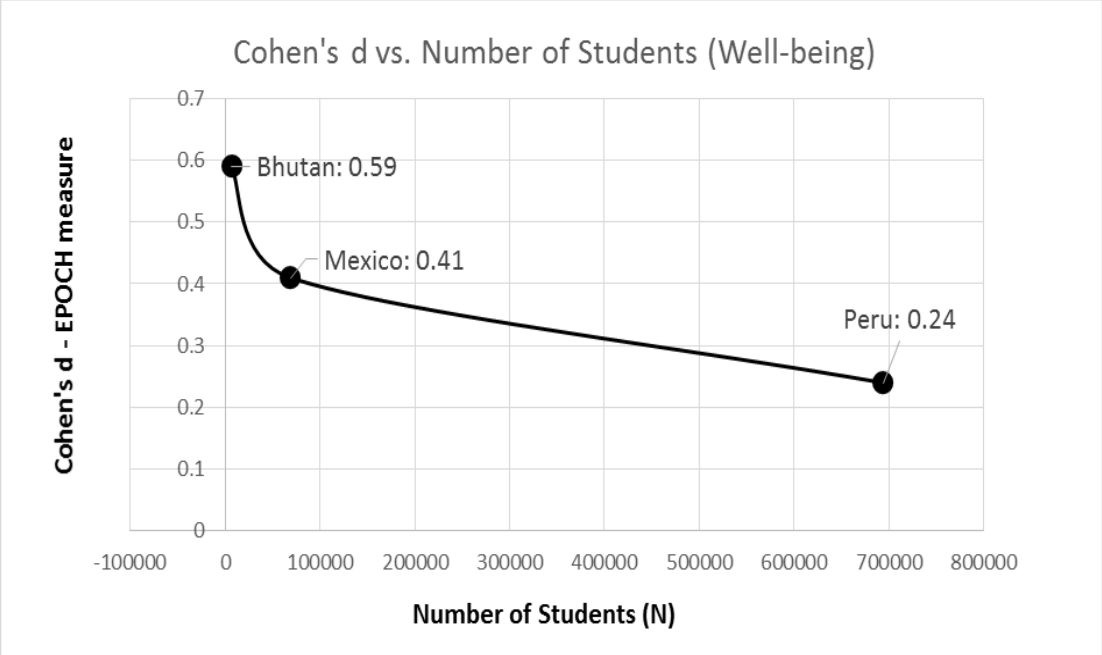
Increases in engagement for students who received the well-being curricula for 11.1% in Peru to 15.8% in Mexico of their post-intervention increased academic performance, controlling for performance on standardized exams at time t0. The literature on "flow" suggests that individuals experience this psychological state when they are using their core strengths, particularly when engaged in an activity aligned with their interests (Csikszentmihalyi, 1991; Peterson & Seligman, 2004). Heightened attention is one underlying mechanism of flow, and prior research has demonstrated that heightened attention leads to enhanced performance (Pashler, Johnston, & Ruthruff, 2001).

Meta analyses have shown that the best interventions that directly target academic performance have, on average, small effect sizes of about 0.15 to 0.20 SDs (Durlak et al., 2011; Heckman & Rubinstein, 2001; Payton et al., 2008). These interventions are expensive and implemented at a relatively small scale (less than 1,000 students). Our interventions had effect sizes on students' performance on national standardized exams of 0.19 SDs with 694,153 students in Peru to 0.53 SDs with 6,524 students in Bhutan. Taken together these results suggest that targeting the skills for well-being might yield even more academic dividends than directly targeting academic performance. Teaching students these life skills may make them more receptive to learning academic material

and may enable them to better deploy their academic skills when taking standardized exams.

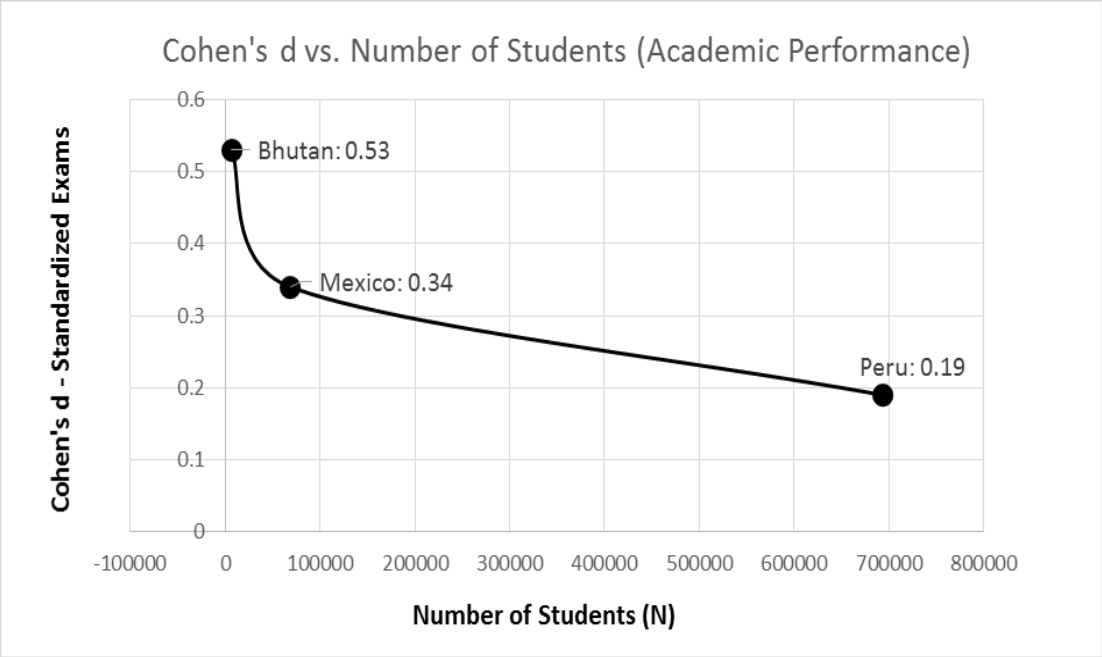
Our results revealed a tradeoff between number of students in intervention and effect sizes, both for well-being and for academic performance.

Figure 7



There was a tradeoff between the number of students in our three interventions and the effect sizes on student well-being. In Bhutan, we had 6,524 students in our RCT and found an effect size of 0.59 standard deviations on their well-being, as measured by the EPOCH measure of adolescent well-being. In Mexico, we had 68,762 students in our RCT and found an effect size of 0.41 standard deviations on their well-being, as measured by the Mexican Spanish-version of the EPOCH measure of adolescent well-being. In Peru, we had 694,153 students in our RCT, and we found an effect size of 0.24 standard deviations on their well-being, as measured by the Peruvian-Spanish version of the EPOCH measure of adolescent well-being.

Figure 8



There was a tradeoff between the number of students in our three interventions and the effect sizes on student academic performance. In Bhutan, we had 6,524 students in our RCT and found an effect size of 0.53 standard deviations on their academic performance, as measured by the NEA national standardized exam. In Mexico, we had 68,762 students in our RCT and found an effect size of 0.34 standard deviations on their academic performance, as measured by the ENLACE and PLANEA national standardized exams. In Peru, we had 694,153 students in our RCT, and we found an effect size of 0.19 standard deviations on their well-being, as measured by the ECE national standardized exam.

Our treatment fidelity results indicate that the larger the size of the intervention, the lower the treatment fidelity of well-being curricula. The treatment fidelities for our three well-being curricula interventions were 87% in Bhutan, 78% in Mexico, and 71% in Peru. There are a number of explanations for the decreases in treatment fidelity as our interventions got larger. The increased layers of trainers could have diluted the fidelity of the implementation of the well-being curricula. In Bhutan, there were no intermediary trainers, in Mexico there was one layer of intermediary trainers, and in Peru there were two layers of intermediary trainers.

The education literature has consistently identified teacher quality as the single most important factor in students' education outcomes, during the schooling years and beyond (Darling-Hammond, 2000; Rice, 2003). The well-being retreats, whether they were for principals and teachers in Bhutan or for trainers in Mexico and in Peru, were designed to be immersive transformative experiences. Only in such a context could adults learn to practice and embody the well-being life skills in a short period of time. The fact that students in each of the three studies were at different distances from the adults who had the immersive well-being retreats could also additionally account for the decrease in treatment fidelity and corresponding effect sizes. In Bhutan, for instance, the actual teachers who experienced the well-being retreat taught students the *GNH Curriculum*. In Peru, on the other hand, teachers who taught students the *Paso a Paso Curriculum* were trained by trainers who themselves were trained by trainers who had the immersive well-being retreat.

With the adequate financial, human, and infrastructural resources during future interventions, all teachers who teach a well-being curriculum could have immersive well-being retreat experiences. Thus, whether we can have the large effect sizes on both well-being and academic performance that we found in Bhutan at a larger scale like Peru is an empirical question that future well-being and education experiments will answer.

A New Educational Paradigm

Even though material standards have improved across most of the world during the last 50 years, well-being has remained roughly unchanged in most countries (Easterlin, 2013; Inglehart, Foa, Peterson, & Welzel, 2007). During the same five

decades, the prevalence of depression has increased at an alarming rate, and the median age of a first episode of depression has also moved from adulthood to early adolescence (Birmaher et al., 1996; Lewinsohn, Rohde, Seeley, & Fischer, 1993; Weissman, 1987; Wickramaratne, Weissman, Leaf, & Holford, 1989). Meta analyses show that mental illness contributes to lower grades, higher absenteeism, lower self-control, and higher dropout rates (Hinshaw, 1992; McLeod & Fettes, 2007). These findings suggest a need for an education that simultaneously raises adolescent psychological well-being *and* teaches academic skills (Steinberg, 2014). Such a "positive education" offers a new educational model that, in addition to academic learning, emphasizes well-being as a buildable life-long resource (Seligman et al., 2009).

Previous small-scale studies have suggested that youth well-being contributes to academic achievement, fewer risky behaviors, and better physical health in adulthood (Caprara et al., 2000; Hoyt, Chase-Lansdale, McDade, & Adam, 2012). Other studies have also suggested that student well-being is likely a protective factor against youth depression and may promote creativity, social cohesion, and good citizenship (Nidich et al., 2011; Wang, Haertel, & Walberg, 1997; Waters, 2011). Moreover, 15 years later in life, adolescents with higher subjective well-being likely earn more money, are more successful, and have higher academic attainment than less happy teenagers (De Neve & Oswald, 2012; Diener, Nickerson, Lucas, & Sandvik, 2002).

So a case can be made for an education that raises well-being in its own right and as preventive of mental illness. In other words, well-being is not morally, politically, religiously, culturally, or tribally charged, but rather a universal pursuit with intrinsic value, especially if lexica and measurement instruments are adapted to local contexts, as

we have done in these three studies (Gable & Haidt, 2005; Haidt, 2003). But a common worry about such interventions is that they might interfere with traditional academic goals and divert scarce resources away from academics. In the three first large-scale, whole-schools randomized studies on well-being and achievement, we showed that teaching the skills for well-being at a large-scale is possible and that it lastingly improves academic performance. We conclude that positive education – building both well-being skills and academic skills hand-in-hand – is feasible and desirable. The evidence our three studies provide allow us to make the argument that positive education, and well-being science beyond education, can and should drive education policy at local, national, and international levels (Adler & Seligman, 2016). This new paradigm will sow the seeds for sustainably enhancing the human condition.

APPENDIX

School Randomization in Bhutan

Following discussions with the Ministry of Education of Bhutan, we selected 18 secondary schools (grades 7 – 12) that are representative of secondary schools in the country. These schools are located in three districts (*dzongkhags*) in Bhutan: Thimphu, Punakha, and Wangdue Phodrang. The secondary schools are the following:

1. Babesa Secondary School
2. Bajo Secondary School
3. Changangkha Secondary School
4. ChangRigphel Secondary School
5. Dechencholing Secondary School
6. Druk Secondary School
7. Jigme Namgyel Secondary School
8. Kelki Secondary School
9. Khasadrapchu Secondary School
10. Lungtenphu Secondary School
11. Motithang Secondary School
12. Nima Secondary School
13. Punakha Secondary School
14. Rinchen Secondary School
15. Samtengang Secondary School
16. Wangdue Secondary School
17. Yangchenphu Secondary School
18. Zilukha Secondary School

The researchers from the University of Pennsylvania and the Ministry of Education staff involved in this project decided to use an algorithm that randomized schools into two groups: a treatment group and a control group. The algorithm did not dictate that the two groups have the same number of schools. 11 of the above secondary schools were assigned to the treatment group, and seven were assigned to the control group.

Data collection in Bhutan

The academic year in Bhutan starts during February, following the two-month winter vacations. Baseline data collection for this study took place during May 2012. Two follow-up measurements took place during September 2013 and September 2014. Students in grades 7 to 12 from the 18 schools in the study completed the May 2012 baseline survey. During the 2013 academic year, only students in grades 8 to 12 completed the follow-up September 2013 survey (students in grade 7 during 2013 were in primary school during baseline data collection in 2012). During the 2014 academic year, only students in grades 9-12 completed the follow-up September 2014 survey (students in

grades 7 and 8 were in primary school during baseline data collection in 2012, and students in grade 7 were in primary school during the first follow-up survey in 2013).

Only data from students who completed all three rounds of survey data collection were used for this study (n=6,524). These were students who were in grades 9-12 during the 2014 academic year. Students were assigned an identification number throughout study. All survey data were anonymous, and only one of the researchers had access to the students' names and their corresponding identification numbers. Throughout the study and up to the present, all data and data analyses are housed in password-protected computers at Bhutan's Ministry of Education. Researchers from the University of Pennsylvania accessed and analyzed all data using remote Internet access to the computers at the Bhutanese Ministry of Education. If reviewers need any further summary statistics or raw data, we would be happy to ask Bhutan's Ministry of Education for permission to share it.

Sample items from Bhutan's National Education Assessment (NEA)

The main function of mitochondria is to:

a) produce energy in cells
b) convert RNA to DNA
c) serve as a membrane
d) produce protein
e) serve as a catalyst in cells

Nguyen has 10 Ngultrum more than Karma. Karma has twice as many Ngultrum as Sangay. Nguyen has 36 Ngultrum. How many Ngultrum does Sangay have?

a) 26
b) 52
c) 13
d) 39
e) none of the above

Sample items from the EPOCH measure of youth well-being

1. I have friends that I really care about.

1	*2*	*3*	*4*	*5*
Strongly Disagree/ Definitely no	*Disagree/ No*	*Don't agree or disagree/ Undecided*	*Agree/ Yes*	*Strongly agree/ Definitely yes*

13. I am satisfied with my life.

1	*2*	*3*	*4*	*5*
Strongly Disagree/ Definitely no	*Disagree/ No*	*Don't agree or disagree/ Undecided*	*Agree/ Yes*	*Strongly agree/ Definitely yes*

Sample Excerpts from *Educating for GNH* training manual

Utilizing the Guide book for Teachers

The **Teacher's Guide book** is a user friendly guide, written in a simple, clear, language and has been developed after interaction and in-depth understanding of adolescent health issues with senior program mangers, health coordinators, doctors, health mangers, teachers as well as students. This is primarily meant to be used by teachers under the Comprehensive School Health Program of the Ministry of Health and the Ministry of Education to promote adolescent health and development in a holistic way. However, the sessions can be adapted and utilized to reach out to "out of school" adolescents by other stakeholders.

This facilitator's guide is the outcome of the "felt needs" of the teachers, School Health Coordinators, adolescent students, and the program managers from the Ministry of Education and Ministry of Health that were expressed during the working group meetings held with the World Health Organisation supported consultant, to develop the guidebook. It was expressed that "information giving alone is not sufficient; the students' skills for taking responsible and healthy decisions also need to be built up". Thus it was decided that a "life skills based education" approach would be adopted to promote the health of the adolescents. The need for the School Health Coordinators to have a broad base of information was also articulated. The uniqueness and the strengths of the Bhutanese way of life were seen as protective in nature and it was decided that they be highlighted.

Before using the Guide take a look at the table of contents so that you get familiar with the subjects that are covered. Then, look through the sessions. All of the sessions have the same format: **Suggested age group, Objectives, Life Skills used, Advance preparation, Activities, Guidelines for the Facilitator, Learning in the Community, and a Fact sheet.**

The suggested **Age Group** tells you the age group for which that session is thought to be of use and relevance. You can select the sessions for a particular age group based on this recommendation. You can be flexible and can use it for other age groups too, if you think it to be of relevance.

The **Objectives** focus on what the students will be able to do and what they should know by the end of the session. Objectives are guides that help you stay on track and keep the discussion focussed on the topic. Care has been taken that objectives are not more than two to three in number and are written in simple language.

Life Skills used: The Life skills which are extensively used in the particular session are highlighted in this column. Reinforce them during and at the end of the session, so that the students develop the skills to internalize the life skills they have learned.

6. Ecoliteracy/ Science

Ecoliteracy is taught in the Bhutanese schools through geography, biology, social science and other subjects, but perhaps it could be looked at more holistically. This breakout group challenged the way science is currently taught (which too frequently is based on a

mechanistic view and exploitation of nature) and recommended approaches to science based on observing and learning from nature and a holistic, integrative approach more consistent with GNH and Buddhist principles and values.

The ecoliteracy breakout group pointed out that "it isn't the people who are scientifically illiterate who are wrecking the earth; it's the scientifically literate people who are ruining the planet." In other words, science is wrongly (and dangerously) taught. We need to challenge the misleading way in which science is currently taught, and ask: "What is science from a universal GNH standpoint? How can science be taught in a way that inspires reverence for the world and for the ecological environment that sustains us?"

At this critical and crucial historical juncture, students need to understand the realities of climate change and of an economic growth paradigm that has created both global warming and global inequality (in which one billion are over-nourished while one billion are malnourished), and we literally have to change the way Science Education is taught. In other words, accepting the existing textbook paradigm and curriculum won't work. We need a new approach entirely—one that values indigenous knowledge, that teaches sustainability and economics accurately in terms of its impact on the earth, and that draws on ancient Bhutanese wisdom that knows how human beings can live in harmony with nature.

Sample Excerpts from Life Skills Course in *GNH Curriculum* for teachers

After a few minutes of discussion hand out the *Characteristics of a Fixed vs. Growth Mindset worksheet (pg. 123).* Discuss each consequence with the teachers to emphasis how important a growth mindset is to education and learning.

Class Activity 2: Identifying Which Mindset We Use

During this activity, the teachers fill out the quiz called *Which Mindset Do You Have?* on pg. 123. Once the teachers have taken the quiz, allow them to discuss their results with their peers.

Homework: Now that you have identified which kind of mindset you have, please write a one page journal entry about your reactions to your results. Were you surprised to find out which mindset you had? Why or why not? Can you see ways in which your mindset effects you or your students? Are you happy with your results, is there anything you wish to change? Reflect generally on what you have learned in the workshop so far.

Guiding Research: The mindset that a student has about their abilities directly influences their academic achievement, grades, and test scores (Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003). The good news is that student's who belong to a disadvantaged or stereotyped group are aided even further by having a growth mindset (Blackwell et al., 2007; Good et al., 2003; Aronson, Fried, & Good, 2002).

Research shows that students perform better in school when both themselves and their teachers belief that intelligence can be grown. Rheinberg (as cited in Dweck, 2007) measured teachers on their believes about intelligence at the beginning of the year and then followed their students progress for the rest of that year; he found that the teachers who had a fixed mindset did not increase their low-performance students' achievement, on the other hand, teachers who had a growth mindset were able increase the performance of their low-achieving students to moderate or high levels of achievement by the end of the year (2007).


Educating for GNH
Thinking Trap
First Step SLOW DOWN
Next Step Ask Yourself...
Jumping to Conclusions
What evidence are you basing this on?
Is there anything you are missing?
Tunnel Vision
What is the bigger picture?
What am I not looking at?
Magnifying and Minimizing
Were there any good things that happened?
Did I do anything well?
Personalizing
Did anyone else contribute to this?
What are outside factors that influenced it?
Externalizing
What did I do to contribute to this?
How much is due to me?
Overgeneralizing
Is there specific behavior that explains this?
Is it logical?
Mind Reading
Did I make my beliefs or feelings known clearly?
Did I tell them all the information?

Treatment Fidelity Checklist

This treatment fidelity model was used to retroactively translate our extensive qualitative notes into quantitative treatment fidelity data using the 5-item checklist below, per guidelines for best practices in longitudinal outcome studies.

Focus Area	Information Used to Evaluate Treatment Fidelity
Design	Evidence that treatment schools and control schools remained separate and that the single-blind design endured. No contamination or communication between schools.
Training	Adherence to the training manual Observation of teachers, note taking, and retroactive checklist of adherence to the training
Delivery	Adherence to the actual *GNH Curriculum* or the placebo *GNH Curriculum* Observation of teachers, note taking, and retroactive checklist of adherence to the curricula
Receipt	Lessons by trained teachers in *Life Skills Course* and lessons by other teachers through a *GNH Lens* Observation of teachers, note taking, and retroactive checklist of adherence to the curricula
Enactment	Monthly unannounced visits to each of the 18 schools in the study by a member of the research team.

***Evaluación Nacional del Logro Académico en Centros Escolares (ENLACE)* in Mexico**

Exerpts from ENLACE

Language comprehension section

LA MOTO

¿Alguna vez te has levantado con la impresión de que algo iba mal? Así fue el día para mí.
Me senté en la cama.
Poco después descorrí las cortinas.
El tiempo era horrible; estaba lloviendo a cántaros.
Entonces, bajé la vista al patio.
¡Claro! Allí estaba la moto.
Tan destrozada como la noche anterior.
Y empezaba a dolerme la pierna.

Algo le ocurrió al personaje de la historia la noche anterior. ¿Qué fue lo que le pasó?

A El mal tiempo había estropeado la moto.
B El mal tiempo había impedido salir al personaje.
C El personaje había comprado una moto nueva.
D El personaje había tenido un accidente de moto

Mathematics section

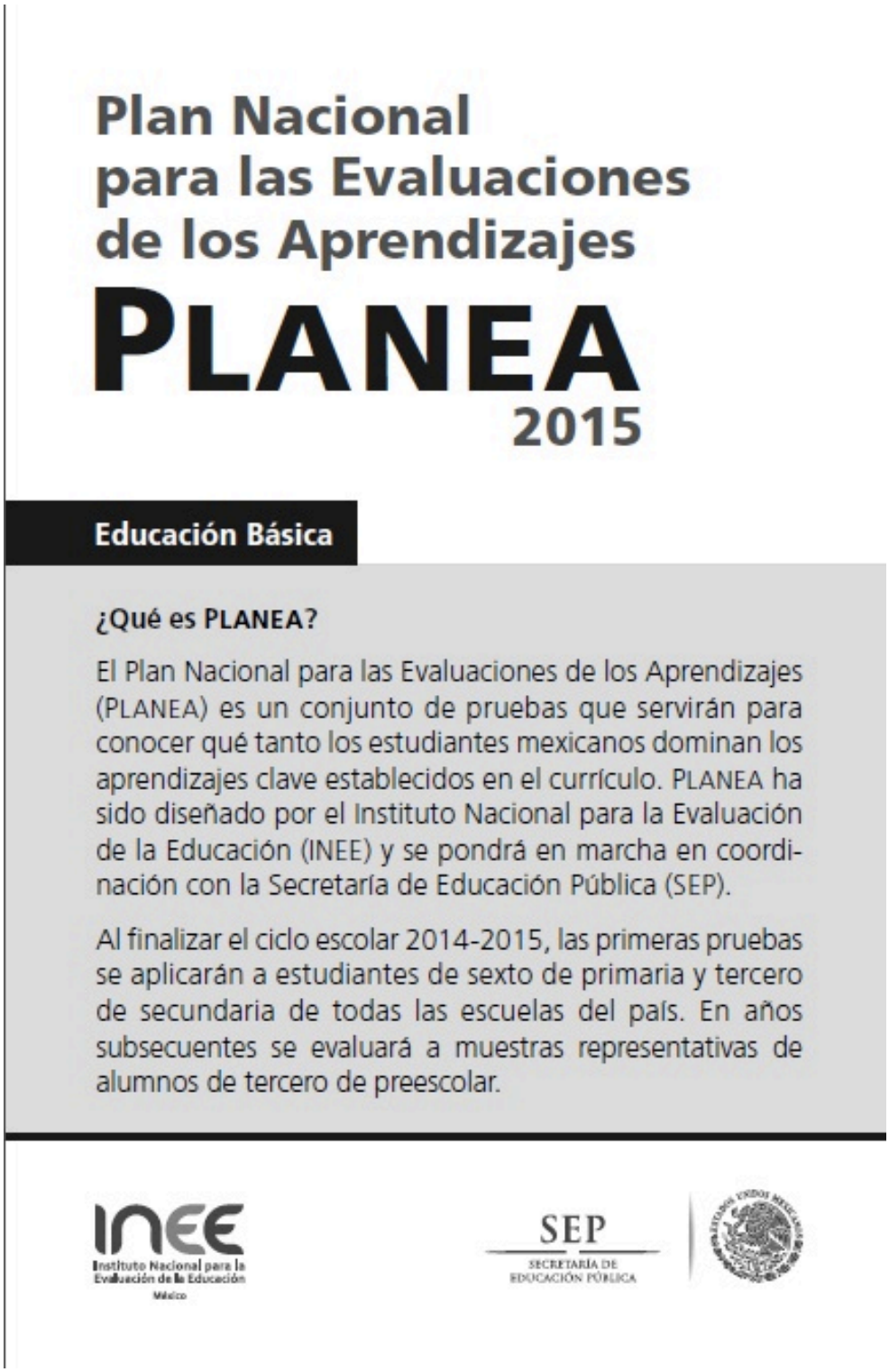
33. Pedro se desplazó en su automóvil por toda la avenida Juárez a una velocidad constante de 50 kilómetros por hora y tardó 5 minutos en recorrerla. Si $\text{velocidad} = \frac{\text{distancia}}{\text{tiempo}}$, ¿qué longitud, en kilómetros, tiene la avenida Juárez?

A) **2.50**
B) **4.17**
C) **5.00**
D) **10.00**

La respuesta correcta a esta pregunta es la opción: **B**
El porcentaje de alumnos en la escuela que contestó incorrectamente esta pregunta es: **77%**

Debilidad: El alumno no logra resolver un problema que incluye una fórmula e implica la conversión de unidades

From ENLACE to PLANEA in 2015



Plan Nacional para las Evaluaciones de los Aprendizajes

PLANEA

2015

Educación Básica

¿Qué es PLANEA?

El Plan Nacional para las Evaluaciones de los Aprendizajes (PLANEA) es un conjunto de pruebas que servirán para conocer qué tanto los estudiantes mexicanos dominan los aprendizajes clave establecidos en el currículo. PLANEA ha sido diseñado por el Instituto Nacional para la Evaluación de la Educación (INEE) y se pondrá en marcha en coordinación con la Secretaría de Educación Pública (SEP).

Al finalizar el ciclo escolar 2014-2015, las primeras pruebas se aplicarán a estudiantes de sexto de primaria y tercero de secundaria de todas las escuelas del país. En años subsecuentes se evaluará a muestras representativas de alumnos de tercero de preescolar.

INEE
Instituto Nacional para la Evaluación de la Educación
México

SEP
SECRETARÍA DE EDUCACIÓN PÚBLICA

***Evaluación Censal de Estudiantes (ECE)* in Peru**

Excerpts from the ECE standardized exam

Reading comprehension section

Lee con atención el siguiente texto:

Al salir de la escuela, María decidió hacerle un regalo a su mamá y fue a buscar semillas. En el campo, María recogió muchas semillas y las metió en una bolsa. Cuando llegó a su casa, ella hizo un bonito collar de semillas para su mamá.

Ahora, marca la respuesta correcta de cada pregunta.

8. **¿Cuándo fue María a buscar semillas?**

   a Cuando llegó a su casa.

   b Al salir de la escuela.

   c Antes de ir al campo.

9. **¿Por qué María recogió muchas semillas?**

   a Porque quería guardar las semillas en su bolsa.

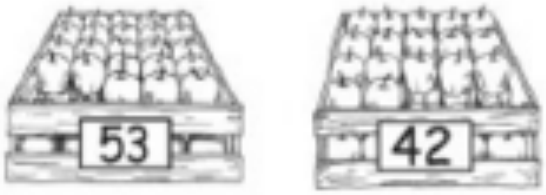
   b Porque la mamá de María necesitaba semillas.

   c Porque quería hacer un collar para su mamá.

Mathematics section

Pregunta 19

En una caja hay 53 manzanas y en otra hay 42 manzanas.



Quieres guardar todas las manzanas en cajas de 10 manzanas cada una. ¿Cuántas cajas necesitas y cuántas manzanas sobran?

a Necesito 95 cajas y no sobran manzanas.

b Necesito 10 cajas y sobran 3 manzanas.

c Necesito 9 cajas y sobran 5 manzanas.

Epoch Measure of Youth Well-being

Psychological Assessment

1040-3590/15/$12.00 http://dx.doi.org/10.1037/pas0000201

The EPOCH Measure of Adolescent Well-Being

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University of Pennsylvania and University of Melbourne

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University of Pennsylvania and Pennsylvania State University

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Temple University and Children's Hospital Colorado

Laurence Steinberg
Temple University and King Abdulaziz University

We introduce the EPOCH Measure of Adolescent Well-Being, which assesses 5 positive psychological characteristics (Engagement, Perseverance, Optimism, Connectedness, and Happiness) that might foster well-being, physical health, and other positive outcomes in adulthood. To create the measure, a pool of 60 items was compiled, and a series of 10 studies with 4,480 adolescents (age 10–18) from the United States and Australia were used to develop and test the measure, including the factor structure, internal and test–retest reliability, and convergent, discriminant, and predictive validity. The final 20-item measure demonstrated adequate psychometric properties, although additional studies are needed to further validate the measure, extend to other population groups, and examine the extent to which it predicts long-term outcomes. As a brief multidimensional measure, the EPOCH measure contributes to the empirical testing and application of well-being theory, and offers a valuable addition to batteries designed to assess adolescent positive psychological functioning.

Keywords: positive psychological functioning, well-being, flourishing, adolescents, assessment, measure development

Supplemental materials: http://dx.doi.org/10.1037/pas0000201.supp

Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2015). The EPOCH Measure of

Adolescent Well-Being. *Psychological Assessment.*

Additional images

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Routledge
Taylor & Francis Group

A multidimensional approach to measuring well-being in students: Application of the PERMA framework

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Seligman recently introduced the PERMA model with five core elements of psychological well-being: positive emotions, engagement, relationships, meaning, and accomplishment. We empirically tested this multidimensional theory with 516 Australian male students (age 13–18). From an extensive well-being assessment, we selected a subset of items theoretically relevant to PERMA. Factor analyses recovered four of the five PERMA elements, and two ill-being factors (depression and anxiety). We then explored the nomological net surrounding each factor by examining cross-sectional associations with life satisfaction, hope, gratitude, school engagement, growth mindset, spirituality, physical vitality, physical activity, somatic symptoms, and stressful life events. Factors differentially related to these correlates, offering support for the multidimensional approach to measuring well-being. Directly assessing subjective well-being across multiple domains offers the potential for schools to more systematically understand and promote well-being.

Keywords: Well-being theory; multidimensional approach; positive psychology; measurement; positive education; adolescents

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Scientific Research

Assessing Employee Wellbeing in Schools Using a Multifaceted Approach: Associations with Physical Health, Life Satisfaction, and Professional Thriving

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Abstract

Purpose: Drawing on recent advances in the field of positive psychology, we conducted a pilot evaluation of employee wellbeing using Seligman's (2011) multidimensional PERMA (positive emotion, engagement, relationships, meaning, and accomplishment) model of flourishing. We analyzed associations between multiple aspects of employee wellbeing and three outcomes: physical health, life satisfaction, and professional thriving. Method: Employees (N = 153) from a large private school in Australia completed a survey with items theoretically relevant to the PERMA theory. Factor analyses recovered the expected five PERMA components and a negative emotion factor. Regression analyses estimated cross-sectional associations between the wellbeing factors and self-reported physical health, life satisfaction, and professional thriving (job satisfaction and organizational commitment). Results: Differential associations support the multidimensional approach to defining and measuring wellbeing. For example, staff with higher engagement and better relationships reported greater job satisfaction and organizational commitment. Conclusions: Multidimensional wellbeing assessments can help school administrators understand and improve staff wellbeing, supporting policy and practice designs that ultimately will promote wellness for all stakeholders in the education system.

Keywords

Wellbeing, Positive Psychology, Measurement, Psychosocial Context, Positive Education

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Kern, M. L., Waters, L., Adler, A., & White, M. (2014). Assessing employee wellbeing in schools using a multifaceted approach: Associations with physical health, life satisfaction, and professional thriving. *Psychology*, *5*(06), 500.


Education for Gross National Happiness
Education is not the filling of a pail.....
Culture brings kindness, fairplay, respect, humanity,
Sense of Purpose, Worth, and self
Head
1.Environmental Conservation
2. Good Governance
3. Cultural Promotion
4. Sustainable & Equitable Development
Home
Heart
Hand
Spirit of cooperation
Culture of Reading / Learn more about others and learn about self
equality and oneness
It is the lighting of a fire

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