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Developing 'Happiness Engineering' Subject for the Schools in India: Designing the Pedagogical Framework for a Sustainable Happiness Curriculum

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***Abstract*—The aim of this research was to develop the *Happiness Engineering* subject by designing a 'sustainable happiness curriculum' and 'pedagogical framework' for the schools in India by adopting the whole school approach. The subject of *Happiness Engineering* is modelled like any other traditional school subject such as History, Chemistry, and Computer Science. The researchers have prepared it by adopting the scientifically proven 'global best practices' exercised in different schools, colleges, and university departments across the globe in 'sustainability education', 'adjectival education', and 'well-being education'. It has been adapted and contextualised to be implemented in Indian schools by considering the available infrastructural resources in existing Indian schools and bearing in mind the feasibility of its effective transaction. Experiences of 129 experts from India that included senior secondary school teachers, school counsellors, pedagogical scientists, learning theorists, health experts, people from NGOs, and professors of education, were used to modify and contextualize the prepared curriculum framework for the subject of *Happiness Engineering* to effectively cater the needs of Indian senior secondary school students. In the developed curriculum framework, a 6-days-a-week class has been proposed, throughout the school days, across the two years of grades 11 and 12. The duration of each class would be of 45 minutes to 1 hour in length. This subject is proposed to be a non-evaluative subject, i.e., no formal examinations shall be there towards the end of the year after the completion of the subject to assess students' learning outcomes. The researchers, however, strongly recommends that it shall be mandatorily introduced across all senior-secondary schools in India. This was suggested unequivocally by all the experts. Three buckets (baskets) have been prepared, namely bucket A, bucket B, and bucket C. These buckets respectively contain 22, 20, and 20 modules (thus making a total of 62 modules) from which, as per the convenience of *Happiness Engineering* teachers and resources available at the disposal of the school, teachers and school administrators shall choose any two modules from each of the three buckets, making a total of 6 modules for grade 11. Similarly, another six modules shall be selected from the remaining 56 modules (i.e., 2 modules from each of the three buckets), for grade 12. Bucket A contains Modules dealing with 'Happiness and Wellbeing' of School Students. Buckets B and C contain modules relating to 'Sustainability Education' and 'Adjectival Education', respectively. Since there are 62 broad themes in 62 modules that are stand-alone topics, thus they can be taught independently. As there is no prerequisite for any module, so each of the modules can be taught in any order for grades 11th and 12th. Along with the curriculum framework and pedagogical strategies, teaching learning materials (TLMs) have also been proposed for the transaction of the subject of *Happiness Engineering*. In the developed *Happiness Engineering* curriculum framework, wherever needed, the directions for teachers to be followed has also been incorporated, which the teachers can use as guiding principles while facilitating the transaction of different modules of the subject of *Happiness Engineering*.**

***Keywords*—Wellbeing, Sustainability, Pedagogy, Happiness, School Education, Teaching, Learning, Indian Schools**

I. INTRODUCTION

Future environmental and social problems that today's children will have to deal with include environmental degradation, peak oil prices, global warming, famine, poverty, health pandemics, population growth, terrorism, and an increase in natural disasters. The mental health problems that the youths are suffering as a result of this complexity are stress and anxiety. The world's largest teenage population resides in India [5]. Adolescents are going through a lot of psychosocial and physical changes at this time, which makes them more vulnerable to stress [6, 7, 8, 10, 15, 30]. Since their academic achievement is crucial to

their future job and higher education [16, 21, 28, 30], academic-related events are thought to be significant stressors for students, particularly in Asian countries [14, 31, 35, 38]. The prevalence of stress among Indian adolescents ranged between 13% and 45%, according to several research conducted after the year 2000 [37]. According to a different study done in Thiruvananthapuram, India, 93%–100% of schoolchildren experienced moderate to high levels of stress, while 1.9% showed signs of severe stress [32]. Nearly two-thirds (63.5%) of Indian students in a study by [9] reported experiencing stress related to academic pressure. India's population is constantly growing, and as a result, the educational system has grown extremely competitive. The students consequently start to experience the stress of competition from the pre-primary level itself in the form of annual exams that determine their advancement to the following grade. At the pre-university level, the pressure to perform academically becomes even more worse because entrance to prestigious colleges is based on grades or test performances. In the Indian educational system, getting excellent grades is more crucial than learning new things. This results in the pupils being overworked academically, which greatly increases the academic stress experienced by Indian teenagers [36]. Liu & Lu [19, 20] found that academic stress not only has a negative impact on students' personal, mental, and physical health but also on their learning and performance levels [11, 33]. According to several research [1, 13], there is a connection between academic stress and internalising and externalising issues in educational settings. Teenagers who are under a lot of stress engage in a variety of dangerous and maladaptive behaviours, such as drug abuse and frequent consumption of alcohol, engaging in unprotected sexual activity, being physically inactive, and having irregular eating and sleeping schedules [18]. Stressed-out adolescents have a high incidence of depression [3]. According to a study conducted in India, teenage mental health disorders and educational stress are significantly correlated [17]. Adolescents must be given the tools to develop resilience and hope in order to combat the rising rates of depression and suffering [39]. This will help them avoid developing mental illnesses. The youth must be given opportunities to develop higher level of cognitive, social, and emotional capabilities necessary to engage meaningfully with their communities. Schools are becoming a more crucial part of helping young people develop their cognitive, social, and emotional skills. As a result, experts have urged schools to adopt a new paradigm of education for the twenty-first century. New technology, new pedagogies, interdisciplinary curricula, open learning spaces, and reformed teacher preparation are just a few of the many components that have been conceptualised as part of 21st century education [12, 22, 40]. The idea that education must foster the 'whole student' through social, emotional, moral, and intellectual growth is central to all conceptualizations of 21st century learning [4, 23, 24, 27]. The interconnections between happiness, well-being, and sustainability are highlighted by sustainable happiness. "Happiness that contributes to individual, community, and/or global well-being without exploiting other people, the environment, or future generations" is how 'Sustainable Happiness' has been characterised [25]. In the context of positive education, the idea of sustainable happiness can be used to promote sustainable conduct in addition to students' overall well-being, which includes their physical, emotional, social, spiritual, and ecological well-being. Despite the fact that we all have a natural drive for happiness, we are more likely to live more sustainably if we are aware of the connection between our happiness and the wellbeing of others and the environment [25]. Sustainable happiness refutes the widely held belief that leading a more sustainable lifestyle will result in a lesser quality of life [2]. Sustainable happiness, on the other hand, encourages possibilities to improve our quality of life and support our community's, country's, and world's well-being [26]. Happiness is a profound, long-lasting sensation of well-being, it is a skill that can be acquired with sincere effort [29]. In order to reap the benefits of subjective well-being, it may be best to develop classroom practices and curricula that promote happiness and well-being in addition to, not in place of, standard educational curricula subjects. The incorporation of happiness curricula (or positive education) has been shown to increase general levels of curiosity, elevate love of learning, promote heightened engagement, create better learning outcomes, contribute to more thriving learning communities, build more elevated emotion like hope, inspiration, and joy, increase social intelligence and better relationships, result in greater career opportunity and success, and support behaving well in all spheres of life. The ability to cope pro-actively and constructively with the challenges that today's children encounter could reach entirely new levels with the help of positive education through a sustainable happiness curriculum. For individuals, communities, nations, and the world as a whole, the fusion of sustainability, happiness, and well-being has the power to transform for a better future. It can hasten changes in beliefs, practises, policies, and conduct. The UN Resolution on Happiness and Well-Being has demonstrated international support, but if we are to fully embrace flourishing [34], it must be viewed in the broadest context, acknowledging that we cannot flourish as individuals in isolation and that our flourishing

cannot continue to be at the expense of other people, other species, or the natural environment. Building sustainable futures thus requires sustainable happiness and well-being, and positive psychology may play a significant role in guiding research and teaching that ushers in a new era of understanding, and political will to embrace sustainability. In light of the aforementioned, the current study was convened with the goal of designing and developing a new "happiness curriculum" and "pedagogical framework" by incorporating components from the UN's Education for Sustainable Development (ESD) initiative.

Conceptual Framework for the Proposed 'Sustainable Happiness Curriculum Model'

1) Philosophical Foundation (Catherine O'Brian's theory of Sustainable Happiness)
2) Psycho-Educational Theory (Revised Bloom's Taxonomy – Cognitive, Affective, Psychomotor)
3) Ecological Foundation (Kolb's Experiential Learning Theory and Immersive Learning)
4) Socio-Economic Foundation (Mezirow's Transformational Learning Model)

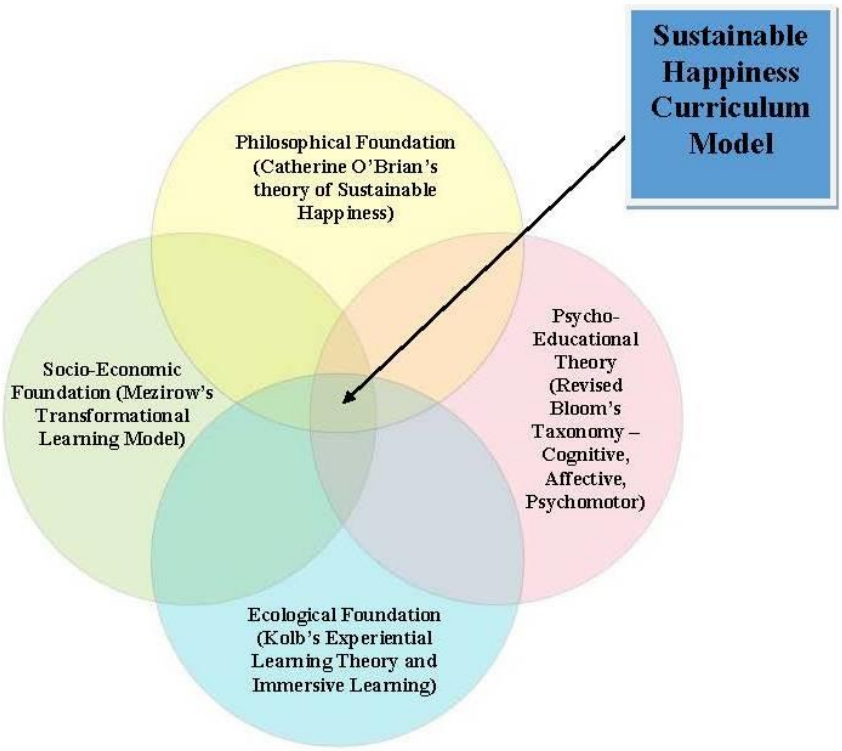

Fig. 1. Conceptual Framework.

II. RESEARCH GAPS

1. Only Delhi has implemented Happiness Curriculum for all its government schools.
2. The incorporation of Happiness Curriculum in other states are at their formative stage.
3. IIT Kharagpur has a course on 'Sustainable Happiness' at the Higher Educational Level. However, no Happiness Curriculums – proposed or currently operational in India, at the school level, takes 'sustainability' into consideration.

III. METHODS AND METHODOLOGY

A. *Key Points*

a) The developed subject has been named "Happiness Engineering".

b) The research objective was to prepare a framework for the curriculum for *Happiness Engineering* subject.

c) *Happiness Engineering* is proposed to be a school subject just like any other traditional school subject, such as History, Philosophy, Chemistry, Computer Science, Mathematics, English, and Economics.

d) It has been prepared by adopting the scientifically proven 'global best practices' exercised in different schools, colleges, and university departments across the globe in 'sustainability education', 'adjectival education', and 'well-being education'.

e) It has been adapted and contextualised to be implemented in Indian schools by considering the available infrastructural resources existing in Indian schools and bearing in mind the feasibility of its effective transaction.

f) Experiences of 129 experts from India that included senior secondary school teachers, school counsellors, pedagogical scientists, discipline experts, practitioners, learning theorists, health experts, people from NGOs, and professors of different disciplines were interviewed, and the analyzed verbatims and narratives were used to modify and contextualize the prepared curriculum framework for the subject '*Happiness Engineering*', to effectively cater the needs of Indian senior secondary school students.

B. *The Curriculum and its Teaching Methodology*

a) In the developed curriculum framework, a 6-days-a-week class has been proposed, throughout the school days, across the two years of grades 11 and 12.

b) The duration of each class would be of 45 minutes to 1 hour in length.

c) This subject is proposed to be a *non-evaluative* subject, i.e., no formal examinations shall be there towards the end of the year after the completion of the subject to assess students' learning outcomes. The researchers, however, strongly recommends that it shall be mandatorily introduced across all senior-secondary schools in India. This was suggested unequivocally by all the experts.

d) Three buckets (baskets) have been prepared, namely bucket A, bucket B, and bucket C. These buckets respectively contain 22, 20, and 20 modules (thus making a total of 62 modules) from which, as per the convenience of *Happiness Engineering* teachers and resources available at the disposal of the school, teachers and school administrators shall choose any two modules from each of the three buckets, making a total of 6 modules for grade 11.

e) Similarly, another six modules shall be selected from the remaining 56 modules (i.e., 2 modules from each of the three buckets), for grade 12. Bucket A contains Modules dealing with 'Happiness and Wellbeing' of School Students. Buckets B and C contain modules relating to 'Sustainability Education' and 'Adjectival Education', respectively.

f) Since there are 62 broad themes in 62 modules that are stand-alone topics, thus they can be taught independently.

g) As there is no prerequisite for any module, so each of the modules can be taught in any order for grades 11^{th} and 12^{th}.

h) Along with the curriculum framework and pedagogical strategies, teaching learning materials (TLMs) have also been proposed for the transaction of *Happiness Engineering* subject.

i) In the developed *Happiness Engineering* curriculum framework, wherever needed, the directions for teachers to be followed has also been incorporated, which the teachers can use as guiding principles while facilitating the transaction of different modules of *Happiness Engineering* subject.

The Subject: *Happiness Engineering*

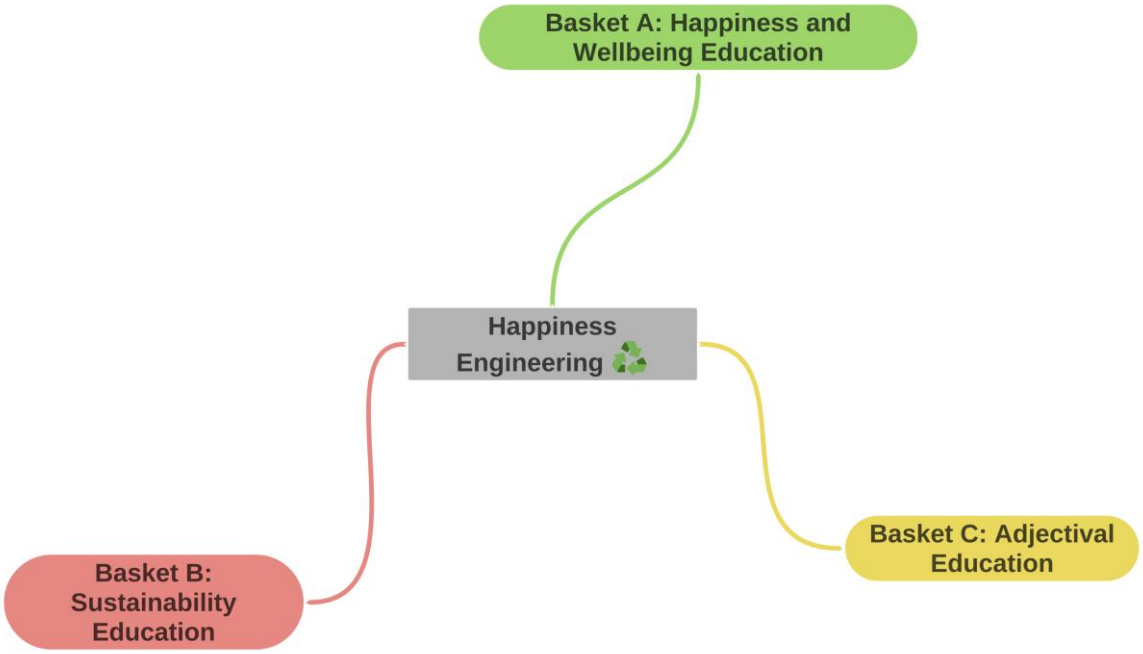

Fig. 2. Happiness Engineering comprises these 3 buckets or baskets.

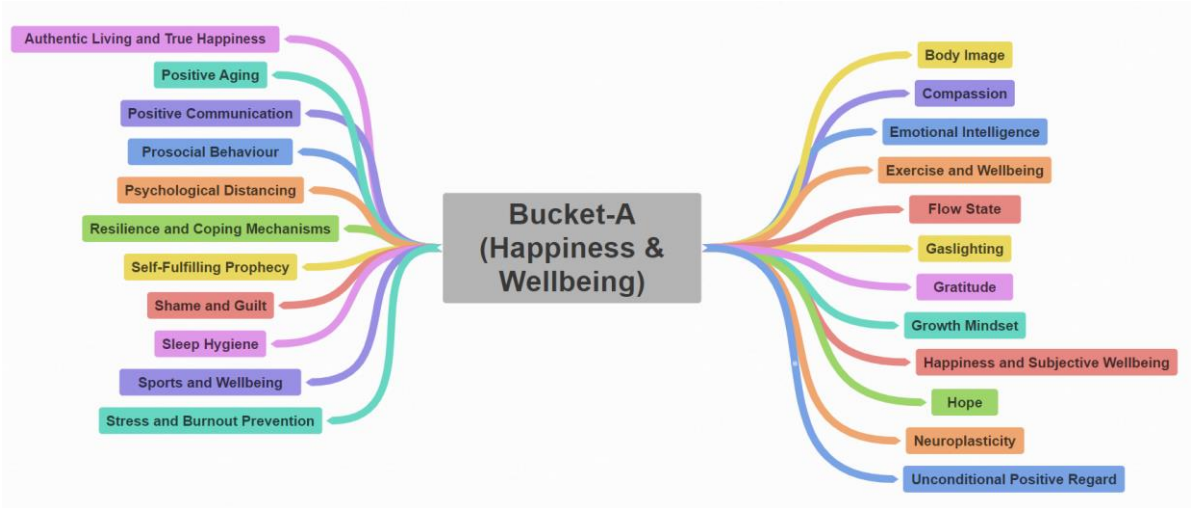

Fig. 3. Bucket A consists of these 22 modules.

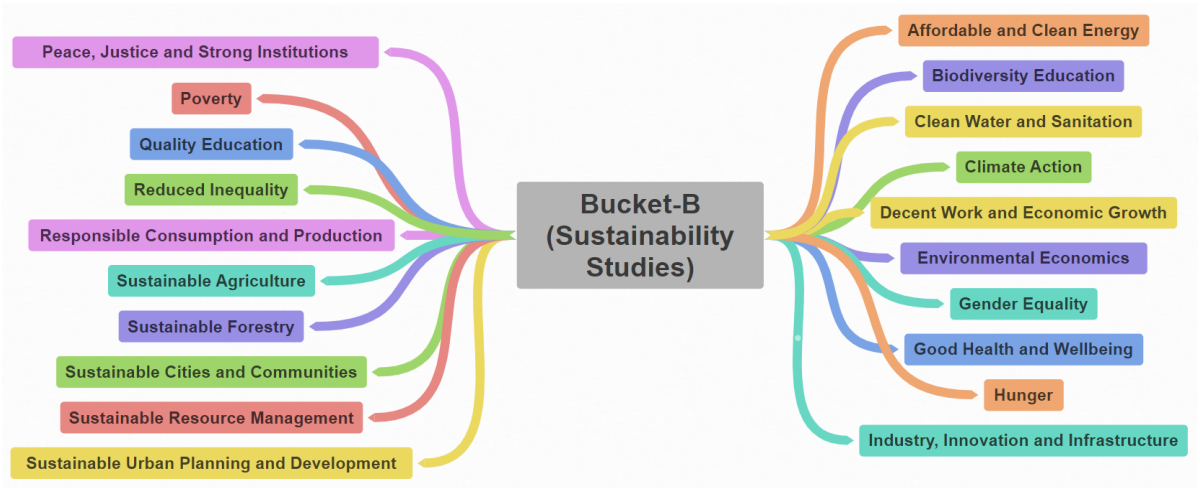

Fig. 4. Bucket B consists of these 20 modules.

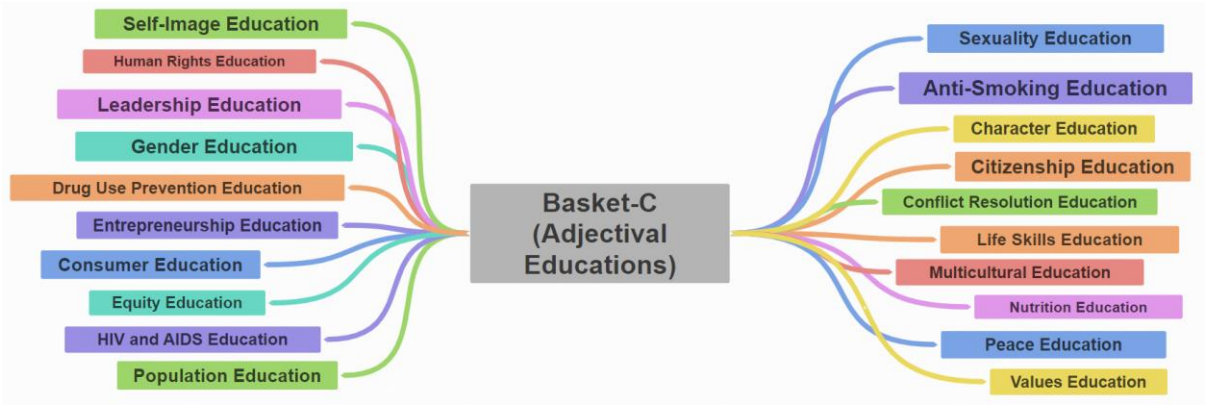

Fig. 5. Bucket C consists of these 20 modules.

C. Curriculum Development Methodology

i. The curriculum framework for the "Happiness Engineering" subject and the pedagogical strategies to be used for its transaction have been prepared in two steps (or stages).

ii. In the first step (or stage), the globally accepted best practices adopted by different schools, colleges, and university departments and centres offering a course on it were thoroughly read, understood, and analysed.

iii. Those that were relevant for the Happiness Engineering subject were cautiously chosen, drawing from several curricula of different universities from across the world.

iv. The second step had two sub-steps. First, its difficulty level was to be brought down to the understanding level of school students. And second, contextualizing it for Indian senior school students.

v. As noted above, 129 experts from India helped in modifying and contextualizing the curricula, as per the needs of Indian senior secondary school students. Suggestions from these experts were used to prepare the curriculum framework for the Happiness Engineering subject, as we see it in its current form (See Link).

Stage-1 of Bucket-A formation

Table-1 shows a few examples of schools, colleges, and universities around the world that offer courses or programs in happiness and well-being education.

TABLE I. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULES FOR BUCKET A OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	School/University/Centre	Description
1.	Centre for Bhutan Studies and GNH Research	It offers research, training, and education in the field of GNH and its application in various sectors, including education.
2.	Geelong Grammar School, Australia	It offers a Positive Education program for students from Prep to Year 12.
3.	Hong Kong Institute of Education, China	It offers a Master of Education in Positive Psychology and Well-being Education.
4.	Inner-City School in Sydney, Australia	It has implemented a positive education program that focuses on developing students' social and emotional skills.
5.	International Positive Education Network (IPEN) - a global network of schools and organizations that promote Positive Education.	It offers a Positive Education Professional Learning Program.
6.	Royal University of Bhutan	It offers a Bachelor of Education in Gross National Happiness (GNH) Education, which focuses on the study of GNH and its application in education.
7.	School of Education, University of California, Berkeley	It offers a Master of Arts in Education with an emphasis on Social and Emotional Learning.
8.	The University of Applied Sciences, Finland	It offers a Master's degree in Positive Leadership and Well-being.
9.	Institute of Continuing Education, University of Cambridge	It offers a course on Positive Psychology and Well-being in their Education program.
10.	The University of East London	It offers a Master of Arts in Applied Positive Psychology and Coaching Psychology.
11.	University of Glasgow	It offers a Master of Education with a concentration in Social and Emotional Learning.
12.	University of Michigan	It offers a Master of Arts in Educational Studies with a concentration in Social and Emotional Learning.
13.	University of Pennsylvania's Graduate School of Education	It offers a Master of Education in Positive Psychology program that focuses on the application of positive psychology in education.
14.	University of San Francisco	It offers a course on Gross National Happiness in Bhutan, which covers the history, philosophy, and application of GNH in Bhutan and other countries.
15.	University of the West of Scotland	It offers a Master's degree in Positive Psychology and Well-being.
16.	University of Warwick, UK	It offers a Master's degree in Applied Positive Psychology and Coaching Psychology.
17.	University of Westminster, London	It offers a Master's degree in Applied Positive Psychology.
18.	Yale Center for Emotional Intelligence	It offers a Master of Arts in Emotional Intelligence program, as well as professional development and research opportunities in the field of emotional intelligence.

Stage-1 of Bucket-B formation

Table-2 shows a few examples of schools, colleges, and universities around the world that offer courses or programs in “sustainable development” and “sustainability education”.

TABLE II. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULES FOR BUCKET B OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	Universities and their Centres / Departments	Courses Names and their Description
1.	University of California, Berkeley - College of Natural Resources, Department of Environmental Science, Policy and Management	Sustainable Development - An overview of the historical and conceptual foundations of sustainable development, including its social, economic, and environmental dimensions. Sustainable Energy Systems - An examination of the scientific, technical, and economic aspects of sustainable energy systems, including renewable energy sources, energy efficiency, and energy storage technologies.
2.	Harvard University - John A. Paulson School of Engineering and Applied Sciences, Environmental Science and Public Policy Concentration	Sustainable Development - An introduction to the concept of sustainable development, including the environmental, economic, and social dimensions of sustainability and the challenges associated with achieving sustainable development. Energy Technology and Policy - An exploration of the technological and policy options for transitioning to a sustainable energy system, with a focus on the roles of government, industry, and civil society.
3.	University of Cambridge - Institute for Sustainability Leadership, Executive Education	Leading for Sustainability - A program designed for leaders across sectors who want to develop their skills in sustainability leadership and management. Sustainability Leadership Lab - An immersive, experiential learning program that helps participants develop the practical skills and mindset needed to lead sustainability initiatives.
4.	University of Amsterdam - Institute for Interdisciplinary Studies, Sustainability Science	Introduction to Sustainability Science - A foundational course that introduces students to the key concepts and approaches of sustainability science, including systems thinking and the Sustainable Development Goals. Advanced Topics in Sustainability Science - A seminar-style course that explores current issues and debates in sustainability science, such as resilience, transitions, and planetary boundaries.
5.	Lund University - International Master’s Programme in Environmental Studies and Sustainability Science	Environmental Policy and Governance - An exploration of the policy and governance frameworks needed to achieve sustainable development, including international environmental agreements, multi-level governance, and stakeholder participation. Sustainable Urban Systems - A course that examines the challenges and opportunities of urbanization from a sustainability perspective, including issues of energy, mobility, and social equity.
6.	National University of Singapore - Faculty of Science, Department of Geography, Bachelor of Environmental Studies	Sustainability Science - An introduction to the interdisciplinary field of sustainability science, including the social, economic, and environmental dimensions of sustainability and the methods and tools used to study sustainability challenges. Sustainable Development and Environmental Ethics - A course that explores the ethical dimensions of sustainable development, including questions of justice, rights, and intergenerational equity.
7.	University of Cape Town - African Climate and Development Initiative, Master of Philosophy in Climate Change and Sustainable Development	Climate Science and Society - An overview of the science of climate change and its social and economic impacts, including the policy and governance responses to climate change. Sustainable Development in Practice - A course that examines the practical challenges of implementing sustainable development initiatives in developing country contexts, including issues of poverty, inequality, and environmental degradation.
8.	Freie Universität Berlin - Environmental Policy and Planning Program, Master of Environmental Management	Sustainability Assessment - A course that teaches students how to evaluate the sustainability of policies, programs, and projects, using tools such as life cycle assessment, environmental impact assessment, and social impact assessment. Sustainable Business and Management - An exploration of the concepts and practices of sustainable business and management, including the role of businesses in advancing sustainable development and the tools and frameworks used to measure and report on sustainability performance.
9.	The University of Manchester - Global Development Institute, Master of Science in Global Development (Environment and Climate Change)	Environmental Governance - An exploration of the political and institutional frameworks for environmental governance at local, national, and international levels, as well as the challenges of coordinating policies across different sectors and scales. Climate Change, Adaptation, and Mitigation - A course that examines the science of climate change and its impacts on social and ecological systems, as well as the strategies and technologies available for adapting to and mitigating the effects of climate change.
10.	Wageningen University & Research - Centre for Development Innovation, Master of Science in Sustainable Development	Sustainable Food Systems - An exploration of the challenges and opportunities of building more sustainable food systems, including issues of food security, nutrition, and food waste. Sustainable Water Management - A course that examines the challenges and opportunities of managing water resources sustainably, including the impacts of climate change and population growth on water availability and quality.

11.	University of Edinburgh - School of Geosciences, Master of Science in Environment and Development	Development, Technology, and Innovation - An exploration of the relationships between technological innovation, economic development, and social and environmental sustainability. Sustainability, Society, and the Environment - A course that examines the social and environmental dimensions of sustainability, including issues of equity, justice, and political power.
12.	University of Oslo - Centre for Development and the Environment, Master's Degree Programme: Development, Environment and Cultural Change (2 years)	Political Ecology - A course that explores the political and economic dimensions of environmental change, including the roles of power, knowledge, and social movements in shaping environmental policy and practice. Climate Change and Development - An overview of the science of climate change and its impacts on development processes and outcomes, as well as the policy and governance responses to climate change.
13.	University of British Columbia - School of Community and Regional Planning, Master of Community and Regional Planning	Urban Sustainability - A course that examines the challenges and opportunities of building more sustainable urban environments, including issues of transportation, land use, and social equity. Sustainable Energy Planning - An exploration of the strategies and technologies for transitioning to a more sustainable energy system, including renewable energy sources, energy storage technologies, and energy efficiency measures.
14.	University of Gothenburg - School of Global Studies, Master's Programme in Global Studies	Environmental Change and Society - An overview of the social and political factors that shape environmental change, including issues of power, knowledge, and governance. Sustainable Development and the Global South - A course that examines the challenges and opportunities of implementing sustainable development initiatives in developing country contexts, including issues of poverty, inequality, and environmental degradation.
15.	University of Helsinki - Faculty of Biological and Environmental Sciences, Master's Programme in Environmental Change and Global Sustainability	Sustainability in Practice - An exploration of the practical challenges of implementing sustainable development initiatives in real-world contexts, including issues of stakeholder engagement, policy coordination, and institutional change. Environmental Governance and Policy - A course that examines the political and institutional frameworks for environmental governance, including the role of international environmental agreements and the challenges of coordinating policies across different scales and sectors.
16.	University of Zurich - Department of Geography, Master of Science in Sustainable Development	Ecosystems and Biodiversity - A course that examines the relationship between ecological processes and human well-being, including the challenges and opportunities of conserving biodiversity and ecosystem services. Sustainable Food Systems and Agriculture - An exploration of the challenges and opportunities of building more sustainable food systems, including issues of food security, nutrition, and food waste.
17.	University of Cape Town - Faculty of Commerce, Graduate School of Business, MBA in Social Innovation and Entrepreneurship	Sustainable Enterprise - An exploration of the concepts and practices of sustainable business and management, including the role of businesses in advancing sustainable development and the tools and frameworks used to measure and report on sustainability performance. Social Innovation for Sustainability - A course that examines the role of social innovation in addressing sustainability challenges, including the design and implementation of social innovations that create positive social and environmental impacts.
18.	Chalmers University of Technology - Department of Technology Management and Economics, Master of Science in Sustainable Energy Systems	Energy Economics and Policy - A course that examines the political and economic dimensions of energy systems, including the role of energy policies and regulation in shaping energy markets and investments. Renewable Energy Technologies - An overview of the different technologies for generating renewable energy, including solar, wind, hydro, and bioenergy.
19.	National University of Singapore - Lee Kuan Yew School of Public Policy, Master in Public Policy (Environmental Policy and Management)	Environmental Economics - An exploration of the economic dimensions of environmental policy and management, including the use of market-based instruments, cost-benefit analysis, and ecological economics. Environmental Governance and Institutions - A course that examines the institutional and policy frameworks for environmental governance, including the roles of different levels of government, civil society, and the private sector in shaping environmental outcomes.
20.	University of Oslo - Department of Education, Master's Programme in Education	Education for Sustainable Development - A course that explores the theories and practices of education for sustainable development, including the role of education in promoting sustainable lifestyles and sustainable societies. Sustainable Development and Global Justice - An examination of the relationship between sustainable development and global justice, including issues of equity, human rights, and intergenerational justice.
21.	University of Manchester - School of Environment, Education, and Development, Master of Science in Sustainable Development	Critical Perspectives on Sustainable Development - A course that examines the critiques and debates surrounding the concept of sustainable development, including issues of power, knowledge, and social justice. Sustainable Consumption and Production - An exploration of the challenges and opportunities of promoting more sustainable patterns of consumption and production, including issues of waste reduction, circular economy, and eco-innovation.
22.	Lund University - Centre for Sustainability Studies, Master's Programme in Sustainability Studies	Social Dimensions of Sustainability - A course that examines the social dimensions of sustainability, including issues of social equity, human rights, and social change. Sustainable Urban Development - An exploration of the challenges and opportunities of building more sustainable urban environments, including issues of transportation, land use, and social equity.

23.	Technical University of Munich - School of Management, Master in Sustainable Resource Management	Sustainable Supply Chain Management - A course that examines the concepts and practices of sustainable supply chain management, including issues of product design, green procurement, and responsible sourcing. Sustainable Resource Economics - An exploration of the economic dimensions of sustainable resource management, including the role of market-based instruments, resource taxation, and circular economy.

Core Disciplines and Adjectival Education

Math, science, language, and social studies are typically considered to be core subjects because they are taught in both elementary and secondary schools all around the world. Depending on budget and cultural goals, other subjects, also referred to as second-tier subjects, are frequently included in the curriculum. Art, music, health, life skills, technical and vocational education and training (TVET), etc. are second-tier academic fields. There are other additional educational specialties that fight for a spot in primary and secondary school. The phrase "adjectival education" was created to describe the educational disciplines with the words "education" or "study(ies)" in their names. There are more than 100 adjectival educations on the list. Education about the environment, fire safety, disaster risk reduction, human rights, etc., constitute adjectival education. These courses give education meaning and relevance.

Stage-1 of Bucket-C formation

The following are a few examples of schools, colleges, and universities around the world that offer courses or programs in different adjectival educations that have a direct bearing on UN's ESD.

TABLE III. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULE ON "ANTI-SMOKING EDUCATION" FOR BUCKET C OF HAPPINESS ENGINEERING SUBJECT.

Sl. No.	Centre/Department/University	Description
1.	Harvard T.H. Chan School of Public Health, Boston, USA	The Harvard T.H. Chan School of Public Health offers a course on "Tobacco Control and Prevention" that provides an overview of the principles and practices of tobacco control and prevention, including the development and implementation of evidence-based tobacco control policies and programs.
2.	Monash University, Melbourne, Australia	Monash University offers a course on "Smoking Cessation for Health Professionals", which provides health care providers with the knowledge and skills necessary to assist patients with tobacco cessation, including evidence-based cessation interventions, motivational interviewing, and relapse prevention.
3.	University of Waterloo, Canada	The University of Waterloo offers a course on "Tobacco Control Policy and Program Planning", which provides an overview of the principles and practices of tobacco control policy development and program planning, including the design and evaluation of tobacco control interventions.
4.	University of Edinburgh, UK	The University of Edinburgh offers a course on "Tobacco, Alcohol and Health", which provides an overview of the health impacts of tobacco and alcohol use, the development and implementation of tobacco and alcohol control policies and programs, and the role of public health in addressing tobacco and alcohol-related harms.
5.	University of California, Berkeley, USA	The University of California, Berkeley offers a course on "Tobacco Control Policy", which provides an overview of the development and implementation of tobacco control policies and programs, including taxation, advertising restrictions, and smoke-free policies.
6.	University of Sydney, Australia	The University of Sydney offers a course on "Tobacco Control and Smoking Cessation", which provides an overview of the health impacts of tobacco use, evidence-based tobacco control interventions, and smoking cessation strategies.
7.	University of Strathclyde, Glasgow, UK	The University of Strathclyde offers a course on "Tobacco Control and Health Inequalities", which provides an overview of the health impacts of tobacco use, the development and implementation of tobacco control policies and programs, and the role of tobacco control in addressing health inequalities.
8.	University of Toronto, Canada	The University of Toronto offers a course on "Tobacco Cessation", which provides health care providers with the knowledge and skills necessary to assist patients with tobacco cessation, including evidence-based cessation interventions and strategies for addressing tobacco addiction.
9.	University of Otago, Wellington, New Zealand	The University of Otago offers a course on "Tobacco Control", which provides an overview of the history of tobacco use and control, the health impacts of smoking, and the development and implementation of tobacco control policies and programs.
10.	University of California, San Francisco, USA	The University of California, San Francisco offers a course on "Tobacco Education for Health Care Providers", which provides health care providers with the knowledge and skills necessary to assist patients with tobacco cessation.

To prepare the curriculum for the Module on 'Citizenship Education' for Bucket C, the researchers referred to the course curriculum of the universities shown in Table-4.

TABLE IV. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULE ON "CITIZENSHIP EDUCATION" FOR BUCKET C OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	Centre/Department/University	Description
1.	Harvard Graduate School of Education, Moduleed States	The course "Democratic Education" provides a critical examination of democratic education and citizenship education, exploring the role of schools in preparing citizens for democracy.
2.	University of Auckland, New Zealand	The "Citizenship Education and Social Change" course explores the role of education in promoting social change and preparing students to become active citizens in diverse communities.
3.	Universidad Nacional de Educación a Distancia, Spain	The "Citizenship and Human Rights Education" program explores the role of education in promoting human rights and social justice, with a focus on the practical implementation of these principles in the classroom.
4.	University of Oslo, Norway	The "Citizenship, Democracy, and Education" course focuses on the development of critical thinking skills, civic engagement, and social responsibility.
5.	University of British Columbia, Canada	The "Citizenship Education and Globalization" course explores the relationship between globalization and citizenship education, including issues of social justice, cultural diversity, and environmental sustainability.
6.	Université Paris Nanterre, France	The "Education, Culture and Citizenship" program examines the role of education in promoting citizenship and intercultural dialogue in diverse societies.
7.	University of Melbourne, Australia	The Faculty of Education offers a course in "Global Citizenship Education," which explores the concept of global citizenship and the role of education in promoting it.
8.	National Institute of Education, Singapore	The "Civic Education" course for primary and secondary school teachers focuses on building knowledge and skills to facilitate students' learning and understanding of civic education.
9.	University of Bristol, UK	The MA Education program offers a course in "Citizenship Education and Globalisation," which aims to prepare educators to promote global citizenship and social justice through classroom practices.
10.	Universität Duisburg-Essen, Germany	The "Citizenship Education and Political Socialization" course explores the relationship between political socialization and citizenship education, with an emphasis on the role of schools and families.

To prepare the curriculum for the Module on 'Character Education' for Bucket C, the researchers referred to the course curriculum of the universities shown in Table-5.

TABLE V. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULE ON "CHARACTER EDUCATION" FOR BUCKET C OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	Centre/Department/University	Description
1.	Jubilee Centre for Character and Virtues, University of Birmingham, UK	The Centre offers a Master's programme in Character Education and Virtue Ethics, as well as a range of short courses and seminars on character education for educators and practitioners.
2.	Positive Education Institute, Geelong Grammar School, Australia	The Institute offers a range of programmes and courses on Positive Education and Character Strengths for educators and students, including a Master of Education in Positive Education.
3.	Harvard Graduate School of Education, USA	The school offers a course called "Education for Goodness' Sake: The Future of Character Education," which explores the history, theory, and practice of character education in schools.
4.	Boston University School of Education, USA	The school offers a course on "Teaching Character and Creating Positive Classrooms," which focuses on developing students' social-emotional skills and character strengths.
5.	Character Education Partnership, University of San Diego, USA	The Partnership offers a range of courses and programmes on character education for teachers, administrators, and parents, including an online course on "The Science of Character Education."
6.	Center for the 4th and 5th Rs (Respect and Responsibility), SUNY Cortland, USA	The center offers a range of programmes and resources on character education for educators, including an online graduate certificate in Character Education.
7.	Hong Kong Institute of Education, Hong Kong	The institute offers a course on "Moral and Character Education in Schools," which examines the theories and practices of character education in schools.

8.	Institute for Global Ethics, USA	The institute offers a range of workshops, seminars, and online courses on ethical leadership and character education for educators, leaders, and students.
9.	UCL Institute of Education, UK	The institute offers a course on "Teaching Character and Resilience in Schools," which explores the theory and practice of character education in schools, and how to develop students' resilience and well-being.
10.	Education for Character Program, University of Oklahoma, USA	The program offers a range of resources, courses, and programmes on character education for educators, including an online course on "Developing Character in Students."

To prepare the curriculum for the Module on 'Drug Use Prevention Education' for Bucket C, the researchers referred to the course curriculum of the universities shown in Table-6.

TABLE VI. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULE ON "DRUG USE PREVENTION EDUCATION" FOR BUCKET C OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	University/Department/Centre	Description
1.	University of Washington, USA	The School of Public Health offers a "Preventing Drug Abuse and Addiction" course. This course covers the history of drug use prevention, evidence-based strategies for prevention, and current challenges.
2.	University of Melbourne, Australia	The Department of Pharmacology and Therapeutics offers a course called "Preventing Drug Abuse and Addiction". This course covers the pharmacology of drugs, the psychology of addiction, and evidence-based prevention strategies.
3.	University of Amsterdam, Netherlands	The Faculty of Social and Behavioral Sciences offers a course "Preventing Drug Use in Youth". This course covers the social and cultural factors that contribute to drug use, effective prevention strategies, and the role of parents and educators.
4.	University of Manchester, UK	The School of Health Sciences offers a "Preventing Substance Misuse in Young People" course. This course covers the epidemiology of drug use, the impact of drugs on health and well-being, and effective prevention strategies.
5.	University of Cape Town, South Africa	The Department of Psychology offers a "Preventing Substance Abuse in South Africa" course. This course covers the social and cultural factors that contribute to substance abuse, effective prevention strategies, and the role of healthcare providers and community organizations.
6.	University of British Columbia, Canada	The School of Nursing offers a course called "Drug Use Prevention in Community Health". This course covers the impact of drugs on community health, evidence-based prevention strategies, and the role of healthcare providers and community organizations.
7.	University of Oslo, Norway	The Faculty of Medicine offers a "Preventing Drug Use and Addiction" course. This course covers the epidemiology of drug use, the psychology of addiction, and evidence-based prevention strategies.
8.	University of Valencia, Spain	The Faculty of Psychology offers a course called "Preventing Drug Use and Addiction in Adolescents". This course covers the social and cultural factors that contribute to drug use, effective prevention strategies, and the role of parents and educators.
9.	University of Auckland, New Zealand	The School of Population Health offers a "Preventing Drug Use and Harm" course. This course covers the pharmacology of drugs, the epidemiology of drug use, and evidence-based prevention and harm reduction strategies.
10.	University of Lisbon, Portugal	The Faculty of Psychology offers a "Preventing Drug Use in Adolescence" course. This course covers the social and cultural factors that contribute to drug use, effective prevention strategies, and the role of parents and educators.

To prepare the curriculum for the Module on 'Sexuality Education' for Bucket C, the researchers referred to the course curriculum of the universities shown in Table-7.

TABLE VII. THE RESEARCHERS DREW INSPIRATION FROM THE CURRICULUMS OF THE SCHOOLS/CENTRES/DEPARTMENTS OF THESE UNIVERSITIES TO DEVELOP THE MODULE ON "SEXUALITY EDUCATION" FOR BUCKET C OF THE HAPPINESS ENGINEERING SUBJECT.

Sl. No.	Centre/Department/University	Description
1.	The Fyrefly Institute for Gender and Sexual Diversity, University of Alberta, Canada	It offers a program in Sexual and Gender Minority Health, which focuses on the health needs of sexual and gender minorities and the social and cultural factors that affect their health.
2.	The Program in Human Sexuality, University of Minnesota Medical School, USA	It offers courses in sex therapy, sexual medicine, and sexual health research, with a focus on the biological, psychological, and social aspects of human sexuality.
3.	The Department of Sexology, Curtin University, Australia	It offers courses in sexuality education, sexual health, and sexual diversity, focusing on developing skills and knowledge for professionals who work with individuals and communities.
4.	The Department of Sexual and Reproductive Health, London School of Hygiene and Tropical Medicine, UK	It offers a program in Sexual and Reproductive Health, which covers a range of topics related to sexual and reproductive health, including contraception, sexual health promotion, and the prevention and treatment of sexually transmitted infections.
5.	The Division of Gender, Sexuality, and Health, Columbia University, USA	It offers courses on gender and sexuality, reproductive health, and the social and cultural determinants of health, with a focus on the needs of underserved populations.
6.	The Department of Gender and Women's Studies, University of California, USA	It offers courses in gender and sexuality, feminist theory, and the politics of sexuality, with a focus on the intersection of gender and sexuality with other aspects of identity and social justice.
7.	The Institute for Gender and Development Studies, University of the West Indies, Jamaica	It offers courses in gender and sexuality, including topics such as sexual and gender-based violence, the politics of sexuality, and sexual diversity in the Caribbean.
8.	The Department of Sexuality Studies, San Francisco State University, USA	It offers courses in sexuality education, sexual health, and sexual diversity, with a focus on the social and cultural contexts of sexuality and the development of sexual literacy.
9.	The Center for Sexual and Gender Diversity, Duke University, USA	It offers courses and programs that promote the understanding of sexual and gender diversity, including workshops on allyship and inclusive practices, and events that celebrate the diversity of sexual and gender identities.
10.	The Department of Sexuality, Education, and Society, University of Sydney, Australia	It offers courses in sexuality education, sexuality and culture, and sexuality and health, focusing on developing critical thinking and research skills in the field of sexuality studies.

It is worth noting that this is not an exhaustive list, many more courses offered by different universities were referred to while preparing other Modules for Bucket-C to prepare the *Happiness Engineering* subject that we see in its current form.

Stage-2 of Curriculum Development

a) Stage 2 had two purposes. Because in Stage-1, the curriculum was collated mostly from higher degree courses from foreign universities, whereas the intent is to develop it for students of standards 11^{th} and 12^{th}. So, in Stage-2, it was first brought down to the level of the understanding of senior secondary school students, and the second purpose was to contextualize it for Indian students.

b) As discussed previously, 129 experts from India helped in modifying and contextualizing the curricula, as per the needs of Indian senior secondary school students.

c) Suggestions from these experts were used to prepare the curriculum framework for the *Happiness Engineering* subject, as we see it in its current form.

d) Telephonic interviews were used to gather qualitative data about suggestions and recommendations to improve the developed curriculum prepared by collating the best practices adopted by courses offered by schools, colleges, and university departments from across the globe.

e) Inputs from the 129 participants helped in improving the course content, gave a structure to the curriculum, and helped in contextualising the curriculum as per the needs of Indian senior secondary school students.

f) A few follow-up calls were also made to further improvise the pedagogical tools and teaching learning materials (TLMs), incorporated into the curriculum.

g) School teachers suggested several ways in which the storytelling method could be used to effectively teach each of the topics.

h) Several games and activities were suggested by teachers, school counsellors, and teacher educators to effectively integrate it into the curriculum to make the subject of *'Happiness Engineering'* more attractive and engaging.

i) Telephonic interviews helped in gathering information about the participants' perceptions, attitudes, and beliefs about the *Happiness Engineering* subject.

j) These telephonic interviews helped gather detailed information from participants about their own teaching experiences and decision-making processes while teaching the same or similar topic in their class, or while preparing a lesson plan or the entire curriculum for a subject.

k) This helped the researchers understand the context and motivations behind participants' actions.

l) The researchers followed up with the participants several times after completing the initial survey.

m) This helped the researchers gather additional information, clarify responses, and helped obtain more detailed information about specific pedagogical practices, and immensely helped in the final design of the curriculum.

n) The researchers chose telephonic interviews over other forms of data collection methods because it was not only convenient for the researchers but was also preferred by the participants in providing information, especially for those who have mobility or time constraints.

o) Most of the participants are from different parts of India, so telephonic interviews were the most cost-effective way to gather data, as there was no requirement to travel physically or other expenses associated with in-person interviews.

p) Most importantly, it saved a lot of time. Telephonic interviews with participants were scheduled at a time that was convenient to the participants, which eventually increased the response rate.

q) Video conferencing applications were deliberately avoided because the feedback was unfavourable for its use. Participants were reluctant to sit in front of the computer to answer the researchers' questions.

r) After six initial Zoom calls, the researchers found that this method was not working in this case.

s) Of those six, two of the participants, only after three to four minutes of the interview, gave their number in the chat box to ask to continue over a telephone call. For the other four, it was found that looking into each other's eyes made them a little uneasy (mostly because we were meeting like this for the first time), which eventually led to finishing the interview in less than six minutes, which was highly ineffective.

t) This is much less time compared to telephonic interviews, where the average conversation time was forty-two minutes.

u) The researchers used several methods for analysing qualitative data gathered from telephonic interviews.

v) The researchers transcribed the interviews to have a written record of the data, which was easier to read, analyse, and compare data, gathered from other participants. The researchers also colour coded the verbatims which helped the researchers identify and label key themes, patterns, and categories that emerged from the data.

w) This was done manually. The researchers then compared the data from different participants to see if the information was consistent or if there were any discrepancies.

x) This helped the researchers identify the outliers or exceptions in the data, which in this case, were very few.

D. Data Collection Techniques

Table 8 shows the semi-structured questionnaire that the researchers administered over experts for data collection for teaching the anti-smoking module for the Happiness Engineering subject:

TABLE VIII. SEMI-STRUCTURED QUESTIONNAIRE FOR THE ANTI-SMOKING MODULE.

Q. No.	Questions
1.	Because this curriculum module has been prepared by collating the global best practices from university courses on anti-smoking education from across the globe, how shall I tailor it to bring it down to the level of senior secondary school students?
2.	Because the curriculum in its current form, that is shared with you, has been taken from curriculums followed by different universities, from across the world, how can I contextualise the curriculum for Indian senior secondary school students, i.e., in what ways can the curriculum on anti-smoking education module be Indianised?
3.	What pedagogical tools do you recommend for teaching an anti-smoking education module? (e.g., lecture, discussion, role play, case study analysis, group work, etc.)
4.	In your experience, what teaching-learning materials have been most effective in promoting anti-smoking messages? (e.g., posters, brochures, videos, infographics, interactive apps, etc.)
5.	Do you recommend using any specific fun games or activities to engage students in the topic of anti-smoking education? If so, please provide some examples.
6.	Have you used storytelling as a teaching method for anti-smoking education? If yes, what are some effective strategies for incorporating storytelling into the curriculum?
7.	In your opinion, what are the most important topics to be covered in an anti-smoking education module?
8.	Are there any specific approaches or techniques you recommend for addressing the social and emotional aspects of smoking and addiction in an anti-smoking education module?
9.	Do you have any suggestions for promoting long-term behavior change among students who have completed an anti-smoking education module?
10.	What common misconceptions or challenges do teachers face when teaching anti-smoking education, and how can they be addressed?
11.	Do you have any additional tips or recommendations for teachers who are new to teaching anti-smoking education?

Similarly, appropriately tailored questionnaires were administered over different experts for the remaining 61 modules as per the theme of the module and specialization of the experts. Anonymity is an important component of scientific research that helps protect the participants, ensure ethical standards are met, reduce bias, protect privacy, and increase the generalizability of the study's findings. Thus, for these reasons, the researchers for the purpose of analysis of verbatims, has replaced the names of all the participants with random, commonly used Indian names.

4.5 Data Analysis

In this research investigation, the researchers has used telephonic interviews to gather qualitative data in the form of verbatims and narrations from 129 experts. Their suggestions were used to modify the first draft of the curriculum that was prepared by collating the global best practices followed by different universities from across the globe. The curriculums that were referred to were mostly for university students who were adult learners and, not for school kids, and also the pedagogical tools and activities prescribed therein, were items and situations that were specific to the nation where it was taught. Experts'

suggestions helped reduce the difficulty level of the curriculum to be easily taught to school students. Also, the original curriculum (obtained after Stage-1 of curriculum development) contained global best practices followed by universities from across the world. It was contextualized using the suggestions from experts so that it could be effectively taught to Indian school students, in a fun and engaging way. The experts gave suggestions on all of this in the form of verbatim and narrations over the phone. That is, the original curriculum was *Indianised* using their suggestions emanating from their experiences. A narrative analysis was performed over the qualitative data gathered from experts. In the current research, qualitative data was gathered through telephonic interviews in the form of verbatims and narrations, using a semi-structured questionnaire (see Table-11), from 129 experts. The verbatims obtained from the interviews were used to modify the existing curriculum that was initially developed for university students, to make it more suitable for school students. In the first step, the curriculum was developed by collating the global best practices from universities around the world. In the second step, the suggestions from the experts were used to contextualize it to the Indian context. The use of telephonic interviews allowed for a large amount of data to be gathered quickly and efficiently, and the verbatims obtained from the interviews were used to modify the curriculum to make it more suitable for the Indian context. The modification of the curriculum using expert suggestions highlights the importance of contextualizing global best practices to fit the local context. The expert suggestions helped reduce the curriculum's difficulty level, making it more accessible for school students. This contextualization is essential for the successful implementation of any curriculum, as it ensures that it is tailored to the needs of the students and is relevant to their experiences. Using narrative analysis to analyze the verbatims obtained from the telephonic interviews allowed for identifying key themes and patterns that emerged from the expert suggestions. These themes and patterns were used to modify the curriculum and make it more suitable for school students in the Indian context. The use of expert suggestions to contextualize global best practices is an important step in ensuring that curriculums are relevant, accessible, and effective for the students who will be using them. The first step was analyzing the verbatims obtained from the telephonic interviews and to transcribe them. This involved creating a written record of what the experts said during the interviews. The verbatims were transcribed manually. The transcription captured all the words spoken by the experts, including any non-verbal sounds, such as pauses or laughter. Once the verbatims were transcribed, the researchers then analyzed them using an iterative coding process. This involved developing a set of codes or categories that were used to identify key themes and patterns in the data. For example, codes were developed based on the research questions and objectives. Some of the codes that were used in this research include "mindfulness practices," "self-awareness," "emotional regulation," "positive relationships," and "stress management." The codes were then applied to the verbatims, and new codes were developed as new themes and patterns emerged from the data. The verbatims were coded manually and not using any coding software. For example, an excerpt from the transcribed verbatim was coded as follows:

Expert: "In my experience, incorporating mindfulness practices has been really effective in promoting sustainable happiness among students. It helps them cultivate self-awareness and emotional regulation skills, which are important for developing positive relationships with others and managing stress."

Codes: mindfulness practices, self-awareness, emotional regulation, positive relationships, stress management

Once the verbatims were coded, the researchers then identified the key themes and patterns that emerged from the data. This involved reviewing the coded verbatims and looking for similarities and differences between them. For example, the codes "mindfulness practices," "self-awareness," and "emotional regulation" were grouped together as a theme related to the use of mindfulness practices to develop emotional intelligence skills among students. The themes and patterns that emerged from the data were used to modify the existing curriculum to make it more accessible for school students in the Indian context. For example, when the experts consistently mention the need for simplified language and concepts, the curriculum was modified to use simpler language and concepts. During the narrative analysis, the researchers transcribed the verbatims, developed a set of codes (or categories), applied the codes to the verbatims, identified key themes and patterns, and finally used these themes and patterns to modify the curriculum initially developed in the first phase by collating the global best practices. The process of iterative coding allowed for a flexible and interpretive approach to data analysis, which was particularly useful when complex and subjective data such as personal experiences or expert opinions were analysed.

Steps (with examples):

1. Transcription: The first step was to transcribe the verbatims from the telephonic interviews. This involved converting the interviews into written texts. It was ensured that the transcription captured the exact words and tone of the participants to enable a more accurate analysis. An example verbatim is "I believe that sustainability education can play a crucial role in helping students understand the interconnectedness of environmental, social, and economic issues. It can equip them with the knowledge and skills needed to make informed decisions and take action to create a more sustainable future."

2. Familiarization: The second step was to become familiar with the data by reading and re-reading the transcripts. This helped in identifying the key themes and patterns that emerged from the verbatims. The researchers remained open to new ideas and perspectives and avoided making assumptions or judgments based on preconceived notions. For example, after reviewing several transcripts, the researchers identified several recurring themes related to sustainability education, including the importance of interdisciplinary approaches, the need for practical, hands-on learning experiences, and the role of educators in facilitating student engagement.

3. Coding: The next step was to code the data by highlighting or marking sections of the text that relate to specific themes or patterns. This involved creating a codebook outlining the categories and subcategories used to organize the data. This was an iterative process, where the codes were refined and revised as more data were analyzed. For example, the researchers created codes for different themes related to sustainability education, such as "interdisciplinary approaches", "practical learning experiences", "student engagement", and "teacher training". Each code was accompanied by a brief description and examples of the types of verbatims that would be included.

4. Categorization: The coded verbatims were then organized into categories based on the codes that were created in the previous step. This involved grouping together verbatims that relate to the same theme or pattern. For example, all the verbatims that were related to practical, hands-on learning experiences were categorized under the "practical learning experiences" code. Similarly, all the verbatims related to teacher training were categorized under the "teacher training" code.

5. Analysis: The final step was to analyze the data by identifying the key themes and patterns that emerged from the verbatims. This involved reviewing the categories and subcategories to identify any trends or insights that may be relevant to the research question. For example, by reviewing the categorized verbatims related to sustainability education, the researchers found that there was a consistent emphasis on the importance of interdisciplinary approaches and practical, hands-on learning experiences. The researchers also identified several challenges related to teacher training and the need for more resources and support for sustainability education in schools.

By following these steps, the researchers gained a better understanding of the experiences and perspectives of the expert participants, and it helped generate insights that informed the researchers and eventually the research.

IV. Findings and Discussions

Here are some of the verbatims from Indian experts that illustrate the importance and ways of using self-reflection exercises to teach authentic living and true happiness to senior secondary school students:

TABLE IX. Few verbatims from Indian experts illustrating the importance and ways of using self-reflection exercises to teach authentic living and true happiness to senior secondary school students.

Sl. No.	Name (Changed)	Designation	Verbatims / Narrations
1.	Dr. Ashwini Kulkarni	Positive Psychology Researcher	"Self-reflection exercises are a powerful tool for helping students to develop greater self-awareness and to make more intentional choices about their lives, leading to greater fulfilment and overall well-being."
2.	Dr. Leela Menon	Self-Compassion Expert	"Self-reflection exercises are a way for students to develop greater self-compassion and learn to be kinder and more understanding towards themselves, which can lead to greater self-esteem and overall well-being."

3.	Dr. Mrinalini Das	Resilience Researcher	"Self-reflection exercises can help students to develop greater resilience in the face of adversity, by teaching them to take a step back and reframe challenging situations in a more positive light."
4.	Dr. Jyoti Gupta	Meditation Teacher	"Self-reflection exercises are a way to help students cultivate mindfulness and develop a greater appreciation for the present moment, which can lead to a greater sense of gratitude and overall well-being."
5.	Dr. Megha Chandra	Social Psychology Expert	"Through self-reflection exercises, students can develop greater emotional intelligence and learn to communicate more effectively with others, which can lead to more fulfilling relationships and greater overall happiness."
6.	Dr. Meena Joshi	Educational Psychologist	"Self-reflection exercises are a way to help students develop a growth mindset, by encouraging them to see challenges as opportunities for learning and growth rather than as failures."
7.	Dr. Nikhil Gupta	Clinical Psychologist	"Self-reflection exercises are a way for students to explore their own identity and to challenge any negative self-talk or limiting beliefs that may be holding them back."
8.	Dr. Neeraj Sharma	Positive Psychology Researcher	"One of the key benefits of self-reflection exercises is that they encourage students to take ownership of their own happiness and well-being. By reflecting on their thoughts and emotions, they help develop the skills to manage them more effectively."
9.	Dr. Neha Chauhan	Mindfulness Expert	"By engaging in self-reflection exercises, students can develop a greater sense of self-awareness and learn to tune out external pressures and distractions to focus on what really matters."
10.	Dr. Aashna Patel	Psychologist	"Self-reflection exercises are a powerful tool for helping students to identify their values, beliefs, and priorities, and to live in a way that's true to themselves."

The verbatims in Table-9 emphasize the benefits of using self-reflection exercises to teach school students about living authentically and achieving true happiness. The analysis of these verbatims and narrations suggests that self-reflection exercises are a powerful tool for helping students develop the skills and mindset needed to live authentically and achieve true happiness. By engaging in self-reflection exercises, students can learn to tune out external pressures and distractions to focus on what really matters to them, ultimately leading to a more fulfilling and purposeful life. Thus, this was made part of the final curriculum.

TABLE X. FEW VERBATIMS FROM INDIAN EXPERTS THAT ILLUSTRATE THE IMPORTANCE AND WAYS OF USING ROLE-PLAYING AND SIMULATION AS A PEDAGOGICAL TOOL TO TEACH ENVIRONMENTAL ECONOMICS TO SENIOR SECONDARY SCHOOL STUDENTS.

Sl. No.	Name (Changed)	Designation	Verbatims / Narrations
1.	Prof. Anika Khanna	Environmental Macroeconomist	"Simulations that involve modelling the macroeconomic effects of environmental policies help students understand the broader economic implications of environmental policy choices."
2.	Dr. Chaitanya Prasad	Environmental Law and Policy Expert	"Role-playing and simulations that incorporate legal and regulatory frameworks help students understand the legal and institutional context in which environmental policy is made."
3.	Prof. Manav Kapoor	Resource Economist	"Simulations that incorporate uncertainty and risk help students understand the challenges of making decisions in complex, uncertain environments."
4.	Dr. Kishan Singh	Environmental Economist	"Role-playing games that involve stakeholder analysis and decision-making help students understand the diverse perspectives that shape environmental policy."
5.	Prof. Maitreyi Bose	Environmental Policy Expert	"Simulations that involve negotiation and coalition-building help students understand the political realities of environmental policy-making."
6.	Dr. Arjun Mehra	Behavioral Economist	"Role-playing and simulations that incorporate social norms and individual preferences help students understand the psychological factors that shape economic decision-making."
7.	Prof. Divya Gupta	Environmental Microeconomist	"Simulations that incorporate externalities and market failures can help students see how economic principles apply to real-world environmental problems."
8.	Dr. Arushi Singh	Environmental Policy Analyst	"Role-playing games are a great way to get students interested in environmental economics and policy, as they make learning fun and engaging while also building critical thinking and problem-solving skills."
9.	Prof. Gopal Prasad	Economics Education Researcher	"Simulations that involve decision-making and trade-offs help students understand the economic rationale behind different policy approaches."
10.	Dr. Krishnan Nair	Environmental Economist	"Role-playing and simulations are powerful tools for teaching environmental economics because they allow students to actively engage with complex concepts and see the real-world implications of economic decisions."

The narrations from Indian experts shown in Table-10 highlight the different ways role-playing and simulation can be used as pedagogical tools to teach environmental economics to school students. The experts note that role-playing and simulations are powerful tools for teaching environmental economics because they allow students to actively engage with complex concepts and see the real-world implications

of economic decisions. These methods can be fun and engaging for students, while also building critical thinking and problem-solving skills. By actively engaging with environmental economics concepts, students can develop a deeper understanding of how economic choices impact the environment. It is worth noting that this is not an exhaustive list of narrations and verbatims, and many more verbatims were put through narrative analysis to come up with the *Happiness Engineering* subject, that we see in its current form (Check Link).

V. CONCLUSION

This research developed the 'Happiness Engineering' subject by designing a 'sustainable happiness curriculum' and 'pedagogical framework' for the schools of India by adopting the whole school approach. Happiness Engineering subject is modelled like any other school subject, just like the other traditional school subjects, e.g., History, Philosophy, Chemistry, Computer Science, Mathematics, English, and Economics. The researchers prepared it by adopting the scientifically proven 'global best practices' exercised in different schools, colleges, and university departments across the globe in 'sustainability education', 'adjectival education', and 'well-being education'. It has been adapted and contextualised to be implemented in Indian schools by considering the available infrastructural resources in existing Indian schools and bearing in mind the feasibility of its effective transaction. Experiences of 129 experts from India that included senior secondary school teachers, school counsellors, pedagogical scientists, learning theorists, health experts, people from NGOs, and professors of education, were used to modify and contextualize the prepared curriculum framework for the 'Happiness Engineering' subject to effectively cater the needs of Indian senior secondary school students. In the developed curriculum framework, 6 days-a-week class has been proposed, throughout the school days, across the two years of grades 11 and 12. The duration of each class would be of 45 minutes to 1 hour in length. The researchers have prepared three buckets: bucket A, bucket B, and bucket C. These buckets (or baskets) contain 22, 20, and 20 units respectively, thus making a total of 62 units, from which, as per the convenience of Happiness Engineering teachers and resources available at the disposal of the school, teachers and school administrators shall choose any two units from each of the three buckets, making a total of 6 units for grade 11. Similarly, another six units shall be selected from the remaining 56 units (i.e., 2 units from each of the three buckets), for grade 12. Bucket A contains Units dealing with 'Happiness and Wellbeing' of School Students. Buckets B and C contain units relating to 'Sustainability Education' and 'Adjectival Education', respectively. Since the 62 broad themes of 62 units are stand-alone topics, they can be taught independently. As there is no prerequisite for any unit, each unit can be taught in any order for grades 11th and 12th. Along with the framework for the curriculum for the Happiness Engineering subject, the researchers has also proposed the pedagogical strategies and teaching learning materials (TLMs) for the transaction of this course. In the developed curriculum framework, wherever needed, the researchers has also incorporated the directions for teachers to be followed, which the teachers can use as guiding principles while facilitating the transaction of different units of the subject. The curriculum framework for this subject and the pedagogical strategies to be used for its transaction have been prepared in two steps. In the first step, the globally accepted best practices adopted by different schools, colleges, and university departments and centres offering a course on it were thoroughly read, understood, and analysed. The one's that were relevant for the Happiness Engineering subject were cautiously chosen, drawing from several curricula of the different universities from across the world. The second step was to contextualize it for Indian senior school students. 129 experts from India helped modify and contextualize the curricula, making it relevant for Indian senior secondary school students. Suggestions from these experts were used to prepare the curriculum framework for the Happiness Engineering subject, as we see it in its current form (See Link). It shall be categorically mentioned here that every bit of what constitutes the curriculum outline and pedagogical approaches suggested for the Happiness Engineering subject has come directly from the suggestions of the pedagogical scientists, curricular experts, learning theorists, and practicing teachers from India, and no idea whatsoever has been put into it by the researchers. The name of the subject (i.e., Happiness Engineering), although proposed by the researchers, has been unanimously accepted and endorsed by the experts.

Detailed Curriculum of Happiness Engineering subject can be accessed here.

Declaration of Interest

No potential conflict of interest was reported by the authors.

Data Availability Statement

The data that support the findings of this study are not available due to the sensitive nature of the research. Moreover, the participants of this study did not give written consent for their data to be shared publicly. Research ethics thus prohibit supporting data to be made publicly available.

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REFERENCES

[1] Bennett TH, Holloway KR. Drug misuse among university students in the UK: Implications for prevention. *Subst Use Misuse.* 2014;49:448–55.

[2] Brown, K., & Kasser, T. (2005). Are psychological and ecological wellbeing compatible? The role of values, mindfulness and lifestyle. *Social Indicators Research,* 74, 349-368. doi:10.1007/s11205-004-8207-8

[3] Busari AO. Evaluating the relationship between gender, age, depression and academic performance among adolescents. *Sch J Educ.* 2012;1:6–12.

[4] Cain, G., & Carnellor, Y. (2008). 'Roots of empathy': A research study on its impact on teachers in Western Australia. *Journal of Student Wellbeing*, *2,* 52–73.

[5] Chandramouli C. Release of Social and Cultural Tables: Age. Data Highlights. *Census of India; 2011.* 2013. Aug, [Last accessed on 2018 Nov 18]. Available from: https://www.slideserve.com/varden/social-and-cultural-tables-age. 2014.

[6] Chida, Y., & Steptoe, A. (2008). Positive psychological well-being and mortality: a quantitative review of prospective observational studies. *Psychosomatic medicine,* 70(7), 741-756.

[7] Clonan, S., Chafoulea, S., McDougal, J., & Riley-Tillman, T. (2004). Positive psychology goes to school: Are we there yet? *Psychology in the Schools, 41,* 101–110.

[8] De Neve, J. E., Diener, E., Tay, L., & Xuereb, C. (2013). The objective benefits of subjective well-being. *World happiness report*.

[9] Deb S, Strodl E, Sun J. Academic stress, parental pressure, anxiety and mental health among Indian high school students. *Int J Psychol Behav Sci.* 2015;5:26–34.

[10] Diener, E., & Chan, M. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being, 3, 1-43. doi:10.1111/j.1758-0854.2010.01045.x*

[11] Fan C, Chu X, Wang M, Zhou Z. Interpersonal stressors in the schoolyard and depressive symptoms among Chinese adolescents: The mediating roles of rumination and co-rumination. *Sch Psychol Int.* 2016;37:664–79.

[12] Fielding, M. (2001). Beyond the rhetoric of student voice: New departures or new constraints in the transformation of 21st century schooling? *FORUM, 43*, 100–112.

[13] Fonseca-Pedrero E, Aritio-Solana R, Chocarro de Luis E. Stress assessment during adolescence: Psychometric properties and measurement invariance of the student stress inventory-stress manifestations across gender and age. *Eur J Dev Psychol.* 2016;13:1–16.

[14] Guo H, Yang W, Cao Y, Li J, Siegrist J. Effort-reward imbalance at school and depressive symptoms in Chinese adolescents: The role of family socioeconomic status. *Int J Environ Res Public Health.* 2014;11:6085–98.

[15] Harter, J. K., Schmidt, F. L., Asplund, J. W., Killham, E. A., & Agrawal, S. (2010). Causal impact of employee work perceptions on the bottom line of organizations*. Perspectives on Psychological Science,* 5(4), 378-389.

[16] Jackson, A., & Davis, G. A. (2000). *Turning Points 2000: Educating Adolescents in the 21st Century.* Williston, VT: Teachers College Press.

[17] Jayanthi P, Thirunavukarasu M, Rajkumar R. Academic stress and depression among adolescents: A cross-sectional study. *Indian Pediatr.* 2015;52:217–9.

[18] King KA, Vidourek RA, Singh A. Condoms, sex, and sexually transmitted diseases: exploring sexual health issues among Asian-Indian college students. *Sex Cult.* 2014;18:649–63.

[19] Liu Y, Lu Z. Chinese high school students' academic stress and depressive symptoms: Gender and school climate as moderators. *Stress Health.* 2012;28:340–6.

[20] Liu Y, Lu Z. Longitudinal analysis of Chinese high school student's stress in school and academic achievement. *Educ Psychol.* 2011;31:723–9.

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

[22] MacDonald, G., & Hursh, D. (2006). *Twenty-first century schools: Knowledge, networks and economies*. Rotterdam, Netherlands: Sense Publishers.

[23] McCombs, B., (2004). The learner-centered psychological principles: A framework for balancing academic achievement and social-emotional learning outcomes. In J. Zins, M. Bloodworth, R. Weissberg & H. Walberg (Eds.), *Building academic success in social and emotional learning* (pp. 23–29). New York: Teachers College Press.

[24] Noddings, N. (1995). A morally defensible mission for schools in the twenty first century. *The Phi Delta Kappan, 76,* 365–368.

[25] O'Brien, C. (2010a). Sustainability, happiness and education. Journal of Sustainability Education, 1. http://www.jsedimensions.org/wordpress/content/2010/04/

[26] O'Brien, C. (2010b). Sustainable happiness and health education: Teacher's guide.

http://www.sustainablehappiness.ca/for-educators/
[27] Palmer, P. (2003). Teaching with heart and soul: Reflections on spirituality in teacher education. *Journal of Teacher Education, 54*, 376–385.
[28] Priller, E., & Schupp, J. (2011). Social and economic characteristics of financial and blood donors in Germany. *DIW Economic Bulletin*, *1*(6), 23-30.
[29] Ricard, M. A. (2003). Guide to Developing Life's Most Important skills: Happiness.
[30] Rosa MC, Preethi C. Academic stress and emotional maturity among higher secondary school students of working and non-working mothers. *Int J Adv Res.* 2012;1:40–3.
[31] Royal Government of Bhutan (2012). The report of the high-level meeting on wellbeing and happiness: Defining a new economic paradigm. New York: The Permanent Mission of the Kingdom of Bhutan to the United Nations. Thimphu: Office of the Prime Minister. http://www.2apr.gov.bt/
[32] Sapna D. *Prevalence of Stress among School Children in Kerala.* 2010. Feb 17, [Last accessed on 2019 Feb 22]. Available from: http://www.articlesbase.com.
[33] Scrimin S, Mason L, Moscardino U, Altoè G. Externalizing behaviours and learning from text in primary school students: The moderating role of mood. *Learn Individ Differ.* 2015;43:106–10.
[34] Seligman, M. (2011). *Flourish: A Visionary new understanding of happiness and well-being.* New York: Free Press. Positive Education Interventions
[35] Solutions (2011). Teaching happiness: The Prime minister of Bhutan takes on education.
http://www.thesolutionsjournal.com/node/934
[36] Sonali S. Impact of academic stress among adolescents in relation to gender, class and type of school organization. *Int J Appl Res.* 2016;2:317–22.
[37] Talwar R, Kumar V. Determinants of psychological stress and suicidal behavior in Indian adolescents. *J Indian Assoc Child Adolesc Ment Health.* 2014;10:47–68.
[38] UNESCO. (2005). Guidelines and recommendations for reorienting teacher education to address sustainability. Education for sustain-able development in action. Technical paper No. 2. http://unesdoc.unesco.org/images/0014/001433/143370E.pdf
[39] Wickramaratne, P. J., Weissman, M. M., Leaf, P. J., & Holford, T. R. (1989). Age, period and cohort effects on the risk of major depression: Results from five United States communities. *Journal of Clinical Epidemiology, 42,* 333–343.
[40] Yates, L. (2007). Learning to 'become somebody well': Challenges for educational policy. *The Australian Educational Researcher, 34,* 35–52.