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## Transforming Obstacles And Stress Among Teens Into Challenges And Opportunities Through Edupreneurship Using Machine Learning Random Forest Regression Analysis

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### Abstract

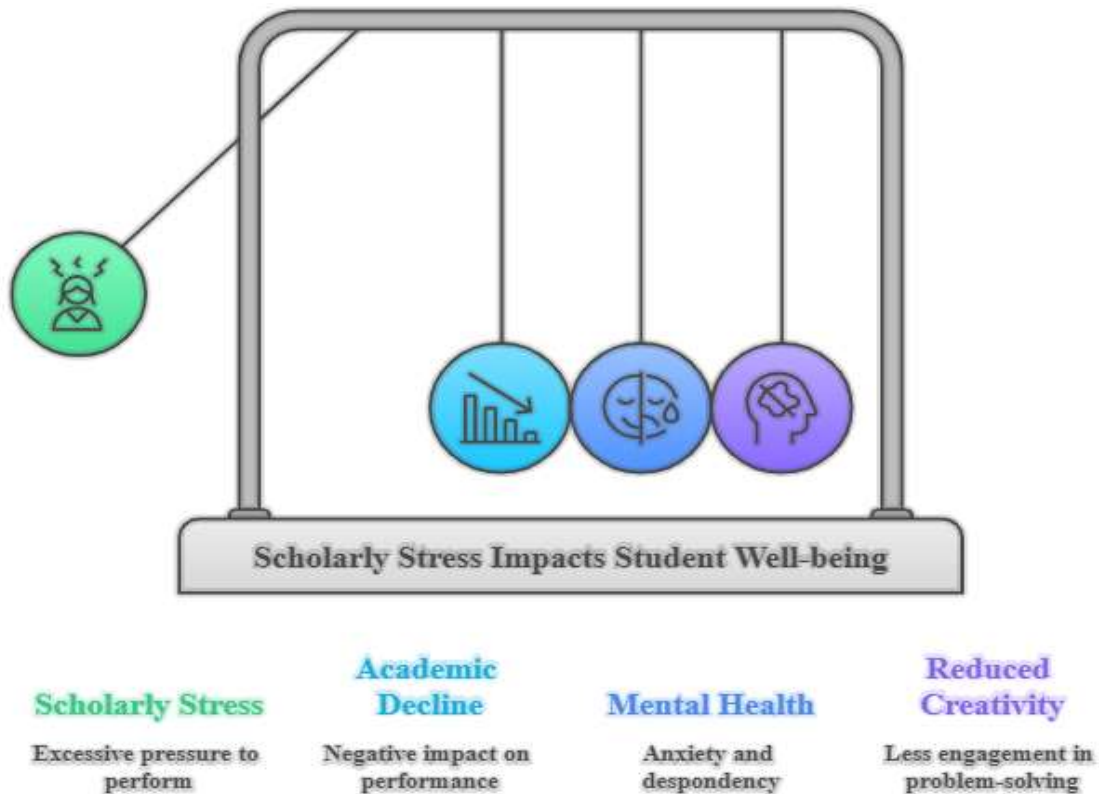
Adolescence is a crucial period of changes in the social, emotional and cognitive realm. There has been a growing academic pressure, competition and evaluation based on performance which has been one of the great stressors of the teenagers these days. One avenue to tackle these challenges as positive opportunities is through a form of entrepreneurial learning which can be manifested in the introduction of some creativity, entrepreneurial thinking, and hands-on learning into the classroom, which we call Edupreneurship. This research not only involves enhancement of the involvement and self-efficacy of the teenagers, but also reduces the academic stress through the role of edupreneurship. The survey and interview of 200 students (secondary schools) in Coimbatore, and Tamil Nadu were performed by a mixed-method study methodology. The results showed that the students in the edupreneurial programs had significantly lower stress levels, higher level of motivation and better problem-solving ability than the students in traditional programs. The paper raises creative pedagogy of the edupreneurship as a new concept, which helps to create resilience, creativity and confidence.

**Keywords:** Adolescents, Academic Stress, Edupreneurship, Engagement, Self-Efficacy, Resilience, Secondary Education.

## 1. Introduction

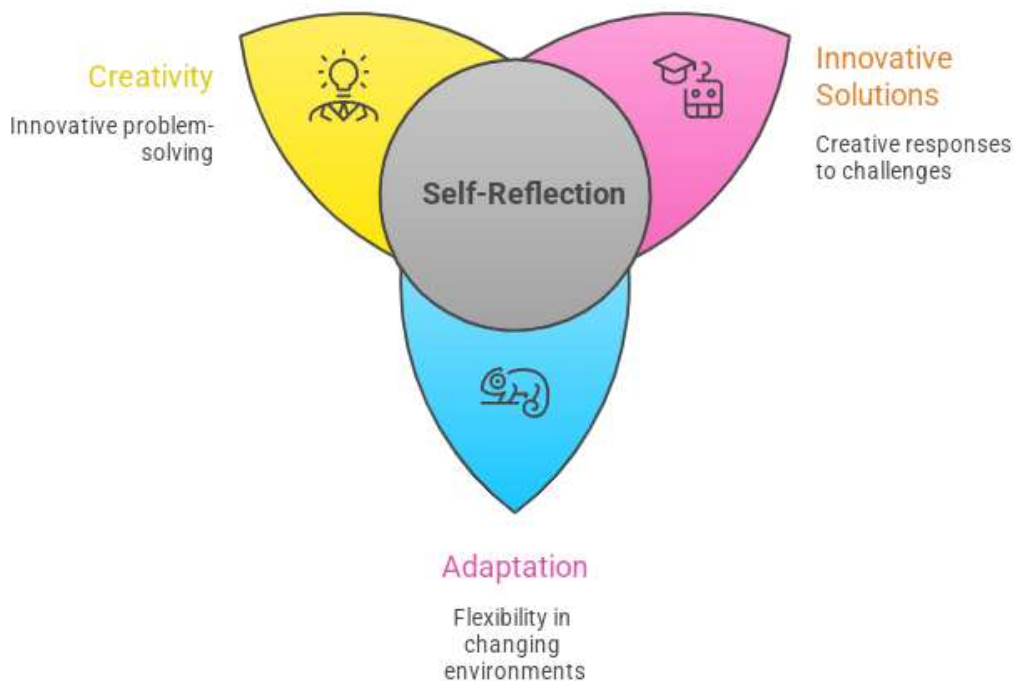
Adolescence, which is a significant period in life, presents numerous social and psychological challenges to the students. The Indian educational system has been affected by the traditional Tamil Nadu system of education recently, as it is rather exam-oriented, resulting in excessive stress in students. Parental, peer, and school pressure to perform well in school is oftentimes the cause of burnout and diminished creativity.

Scholarly stress affects academic performance, motivation, and self-esteem in a negative manner, as per the studies (Putwain, 2007). The below figure 1 describes Stress Impacts among Students, stressed students have a high likelihood of being anxious and despondent and have a low likelihood of engaging in creative or problem-solving related actions due to chronicity. In this case, innovative educational strategies such as self-directed learning, emotional resilience, and holistic development are needed.



**Figure 1.** Stress Impacts among Students

Educational entrepreneurship is an option that promises to be fruitful. It enhances the students to be able to view problems, develop creative solutions and take charge of their education by introducing entrepreneurial learning in the classroom. Edupreneurship helps students perceive academic challenges as opportunities instead of being a barrier by emphasizing on creativity, adaptation and self-reflection. The below figure 2 describes Power of Educational Entrepreneurship.



**Figure 2.** Power of Educational Entrepreneurship

This paper examines how teenagers in Coimbatore could apply edupreneurship to transform stress to a growth challenge.

## 2. Related Work

**P Geetha Bhaskaran & Dr. Minikumari D (2025)** et.al [1] explored the role of Socio-Emotional Resilience (SER) in cultivating entrepreneurial abilities in higher secondary school students. The research emphasizes that SER encompassing emotional regulation, optimism, social support, and persistence equips students with the psychological and emotional tools needed to innovate, take risks, and recover from setbacks, which are essential for entrepreneurial success. The authors advocate for integrating SER training into school curricula to foster resilient, empathetic, and adaptable future entrepreneurs, in accordance with India's National Education Policy (NEP) 2020. Entrepreneurial Skill Development: The study focuses on how to combine socio-emotional skills (such as emotional regulation, empathy, resilience) with entrepreneurial training to create well-rounded individuals who are ready for personal and professional challenges. No Empirical Validation: The study does not utilize primary data or statistical analysis and is therefore a qualitative and descriptive approach that is not able to measure the direct effect of any SER interventions on entrepreneurial outcomes of students.

**Ishita Bansal (2025)** et.al [2] Investigated the phenomenon of youth entrepreneurship in the digital era, focusing on the use of digital platforms by high school students to initiate and operate their business. They discuss their reasons for developing an interest in the field—economic independence, creative expression, and social impact—and share the digital tools and business models they've developed, such as e-commerce, freelancing, content generation, and tech startups. It also identifies some of the critical issues such as legal limitations, scarcity of funding, time management, and lack of formal business education. The study recommends policy changes, curriculum integration and mentorship to provide systemic support for teen entrepreneurship to continue to grow and transform youth economic participation. Overall, the research offers a fresh look at the ways in which digital-native teens are using platforms such as TikTok, Instagram and Shopify to start businesses, and it has implications for teachers, policymakers, and support programs. The study is largely based on case studies, surveys, and secondary literature and may not have broad or deep applications, particularly in other socioeconomic and cultural settings.

**Donato A. Caña (2025)** et.al [3] conducted a study on the business abilities and experiences of senior high school students in Monreal National High School, Philippines and their small businesses. The research adopted mixed methods, which showed that the students have high levels of entrepreneurial potential in the aspects of risk taking and technical skills, but they require improvement in communication and problem-solving skills. Various entrepreneurial projects such as sustainable fashion, recycling projects, food/drink businesses etc. were undertaken with success to improve students' skills. They are better prepared for entrepreneurship as a result of their involvement in school programs and corporate events. Nonetheless, obstacles such as insufficient initial funding, constrained resources, and juggling academics with entrepreneurship were considerable. The study concludes with recommendations for specific trainings, mentorship, hands-on learning and financial assistance programs to promote student entrepreneurs. The study employs a dual approach of quantitative survey and qualitative interview that makes its findings robust and insightful when it comes to students' entrepreneurial skill level, experience and challenge, with implications for teachers and policy makers. The scope of the research is limited to Monreal National High School in Masbate, Philippines, which may limit the conclusions of the study to other areas, cultural contexts, and educational systems, respectively.

**Calvin J. Caliat (2024)** et.al [4] A study was conducted by McKeown to analyze the problems and obstacles faced by student entrepreneurs of Mindanao State University Tawi-Tawi College of Technology and Oceanography, Philippines. The study conducted in a qualitative way using 55 student entrepreneurs revealed that the biggest problem to be faced in establishing a business is lack of financial capital, and the biggest challenge faced in running the business is lack of experience. The study also revealed gender differences in barriers and constraints as well as differences in business structure barriers and constraints. Based on the findings of this study, the researchers draw the following conclusions: Student entrepreneurs have financial and technical constraints that hinder their entrepreneurial skills and the researchers recommend that the academic institutions, government bodies and the private sector can provide targeted assistance in order to

promote student entrepreneurship. The study is able to pinpoint and rank the most important problems (capital) and difficulties (experience) of the student entrepreneurs to act upon the defined interventions. The research was conducted with a small number of respondents (55) from one university in the Tawi-Tawi region, Philippines, and may not be generalizable to other student entrepreneurs.

**Kushwaha, P. K., Pandey, N., Kumar, N., & Kumari, D. (2024)** et.al [5] analysed the challenges India's student entrepreneurs have to encounter in the entrepreneurial journey and the factors that constrain their entrepreneurial journey. The research was a mixed method approach, using primary data and qualitative insights collected through questionnaires and secondary data was collected from literature searches. It was observed that limited access to financial resources, lack of guidance, difficulties in balancing academic studies and business responsibilities, challenges due to the regulations, and societal perceptions are the major barriers affecting student entrepreneurship. Another important aspect of the study was the impact of cultural values and education systems on students' entrepreneurial intentions. The authors have recommended the need to build an enabling ecosystem for students to address the challenges through policy support, institutional mentorship programmes and educational reforms for catalyzing innovation and economic growth in the Indian context. The study systematically identifies and analyzes the various dimensions of the problems encountered by student entrepreneurs in India, which include financial problems, regulatory problems, mentor problem and socio-cultural problem etc., to give a comprehensive picture of the entrepreneurial environment. The study uses a small sample size of 100 responses and may not reflect the entire spectrum of diversity in terms of background, region and industry among the people of India, thus restricting the generalizability and robustness of the findings.

**Ruseva, Baltova, and Nikolova (2024)** et.al [6] Studied problems and effective strategies in entrepreneurship education (EE) in high school with a focus on the relationship between formal and informal assessment. In a small-scale experiment and an on-line survey of students ages 15-16 they explored how they would like to see informal, experiential learning approaches (hackathons, projects, guest speakers) integrated with formal learning approaches. The results suggested that the informal strategies had a significant positive effect on students' motivation, engagement and learning outcomes, with 65% of students in the experimental class performing at an excellent level, compared to 45-48% of students in the traditional classes. Based on the study, it was concluded that although formal education can give entrepreneurs basic knowledge, informal education is more effective in cultivating the entrepreneurial mindset as it is practical, flexible and experiential, and suggests a combination of both in order to have a holistic approach to EE. The study offers empirical evidence from a controlled classroom experiment that the informal, experiential teaching methods that were employed in the study (e.g., projects, hackathons) are significantly more effective than traditional formal instruction in entrepreneurship education, with a measurable improvement in student performance (excellence rate of 65% vs. 45-48%). The findings of the research are limited to a small sample size (78 students in a single specialized high school) and a narrow geographic context (Burgas, Bulgaria), which did not allow for the results to be extended to other, more diverse, education contexts and students.

**Turyamureeba (2024)** et.al [7] examines the importance of resilience in students' ability to manage stress and adversity in school. The paper explores the factors that contribute to resilience development, such as nurturing connections, elevated expectations, and chances for significant involvement, based on an ecological, constructivist model. It calls for embedding resilience-approaches in education curricula and developing conducive institutional settings. The final sections highlight that resilience can improve educational outcomes and contribute to the long-term success of students' personal and professional lives, providing them with effective coping mechanisms and a robust network of social support. The paper offers a well-developed, theory grounded model (ecological, constructivist) that bouthere explicitly identifies strategies that can be implemented in educational institutions, notably in terms of creating supportive relationships, setting high expectations, and creating opportunities for participation, making it useful for curriculum design and services for students. The study is mainly conceptual and review in nature, and does not offer original empirical data, quantitative outcomes, or specific indicators of the effectiveness of the proposed strategies to enhance community resilience, and can therefore not substantiate causal effects or comparative advantages.

**P. Deepthi, Dr. K. Venkata Nagendra, and P. Bhanumathi (2024)** et.al [8] Reviewed the literature on academic stress in students, conceptual framework, causes and its management strategies. The research highlights the subjectiveness of stress responses, how it is perceived and how it reacts to stressful situations,

which can lead to depression, anxiety and other health complications. Factors that were cited as stressors are as follows: academic load, fear of failure, peer pressure, pressure from parents and insufficient support. The review also addresses how stress occasionally can be motivating but at other times can be harmful to academic achievement and wellbeing. It ends by stressing the importance of having an improved system of support, alternative assessment methods, and stress management, such as exercise, meditation, and time management. The study offers a clear but comprehensive synthesis of the numerous academic, social, and environmental stressors that impact students with multiple references and empirical studies. It provides practical stress management techniques including exercise, meditation, sleep habits and positive thinking that can be used in real classroom situations. It is a review paper and therefore does not include any new primary data or research, but rather, it synthesizes existing literature to provide a comprehensive overview of the subject.

**Dr. Ravinder Kumar, Krishan Lal (2024)** et.al [9] Examined the developmental stage of adolescence and the special challenges of adolescent special needs. Adolescence is defined as a transitional period (ages 10–19) when bodies, minds, social and emotional roles are changing. It identifies the increased risk of youth with disabilities (such as autism, intellectual disabilities or sensory disabilities) and underscores the importance of providing specialized educational, therapeutic and social interventions. The paper also briefly introduces some important theories (Erikson, Piaget, Bronfenbrenner), factors that can affect the adolescent and the complex needs of the adolescent (biological, psychological, sociological, educational, vocational). It ends with a clear description of the importance of special education and special educators in supporting inclusion, individual learning, transition planning and empowerment of adolescents with special needs. The study offers a comprehensive understanding of adolescence, encompassing biological, psychological, social and cultural dimensions, as this is vital to the understanding of both neurotypical and special need adolescents. The paper is mostly theoretical and review in nature, and there is no empirical study or cases to support the proposed frameworks and interventions for adolescents with special needs.

**Obschonka, M., Zarea, F., & Vankov, D. (2023)** et.al [10] Carried out a systematic review of the development of entrepreneurial skills during adolescence and its influence on economic change. The study presents a theoretical foundation and empirical evidence on the development of entrepreneurial mindsets, non-cognitive skills and enterprising behaviours in early life stages, especially through entrepreneurship education programs within the school context. The results suggest that high-level entrepreneurial alertness, entrepreneurial intention and non-cognitive skills can be promoted among the adolescents through entrepreneurship education programs, both in developed and developing settings. Early interventions and gender-responsive program design are emphasized, as are contextual adaptation and embedding digital technologies in order to improve long-term economic and social outcomes. The study offers a thorough theoretical synthesis connecting the links between EEE and economic transformation in the longer term, which will have implications for policy and curriculum design. The study is a systematic review, meaning it is heavily dependent on existing literature and has few experimental and longitudinal studies that are able to draw robust causal inferences regarding the relationship between entrepreneurship education and entrepreneurial outcomes that take place in the real world.

**Nguyen, P. T. (2025)** et.al [11] explores how the level of religious commitment and perceived stress affect entrepreneurial motivation and intention among the university students in Vietnam. In this study, 120 religious students were used to analyze the data collected from scales measuring religiosity (Duke University Religion Index), entrepreneurial motivation (self-efficacy, risk tolerance, attitude towards self-employment), entrepreneurial intention and perceived stress by using PLS-SEM. The results indicate that both intrinsic religiosity and low self-efficacy have a negative effect on entrepreneurial motivation while low self-efficacy has a negative effect on entrepreneurial intention. Intrinsic religiosity is the indirect link between religious practice and motivation. Helplessness was demonstrated to reduce the positive relationship between the factors of intrinsic religiosity and motivation. Demographic factors such as gender, family business experience, and entrepreneurial clubs membership also have a vital role in creating entrepreneurial characteristics and intentions. This study brings together the constructs of religious factors, psychological stress and motivational constructs under one umbrella, providing an in-depth view of the interactions between internal psychological and spiritual conditions and their impact on entrepreneurial intention, particularly in the context of collectivism and spirituality, such as Vietnam. The sample size is small ( $n = 120$ ) and the study's convenience sample may not be representative for other religious university students, or for non-religious university

students, other cultural settings, or older students. In addition, the cross-sectional design does not allow causal inferences.

**Dr. Rajeev Kumar Singh (2025)** et.al [12] investigates the serious psychological effects associated with cyberbullying among adolescents, highlighting the widespread and unstoppable nature of cyberbullying due to the prevalence of the use of social media and technology in communication. The paper examines how cyberbullying affects teens' emotional wellbeing by causing anxiety, depression, self-image problems, suicidal thoughts, and feelings of isolation. It also highlights the importance of reviewing laws and policies designed to stop cyberbullying, the role played by social media and technology firms, as well as preventive measures that can be used to curb the practice such as educating teens, parental oversight, and the use of technology controls. The main point made is that addressing cyberbullying involves the use of a multi-faceted approach that incorporates education, psychological support, enforcement of laws, and corporate responsibility. The research is a balanced study of cyberbullying since it brings together psychological, legal, technological, and educational approaches in studying the problem.

**Serhiy O. Semerikov (2025)** et.al [13] proposed an entrepreneurial education-driven model that focuses on resilience, innovation, and opportunity discovery in students amid crises and uncertainties. From the abstract and conclusion sections of the article, it is clear that the paper explores how entrepreneurial and STEM education environments foster skills development and innovation among students in response to challenges, disruptions, and stress. The study integrates insights from multiple research sources regarding the positive outcomes of project work and experiential education on students' adaptive and emotional resilience. In its conclusion, the paper asserts that incorporating edupreneurship into educational institutions is key in helping students cope with stress in order to be ready for the challenging socio-economic environment. The Conclusion Is Well Supported: Strong Emphasis on Resilience and Opportunity Discovery.

**Wardana, L. W., Narmaditya, B. S., Maula, F. I., et al. (2025)** et.al [14] entrepreneurial Orientation (EO) and Adversity Quotient (AQ) through intervening variables of strategic agility in higher education setting was investigated. In this research, PLS-SEM model is used to analyze data collected from students in Indonesian Universities. Research findings show that EL and EO have positive impact on AQ and strategic agility acts as partial mediator for EL-AQ relationship and full mediator for EO-AQ relationship. In this paper, the importance of practical and hands-on learning methods is emphasized, which is in line with SDG-4 and SDG-8. This study might face some possible biases such as geographical bias, common method bias.

**Gonzalez-Prada, V., Sandoval-Trigos, J. C., Moreno-Menendez, F. M., et al. (2024)** et.al [15] the study was conducted to determine the factors influencing the entrepreneurial intentions of Selva Central University students of Peru using the theory of planned behavior (TPB). The sample used for this study was 114 students and self-efficacy emerged to have the most influence towards fostering entrepreneurship ( $r = 0.864$ ) followed by attitude and subjective norm, explaining 79.2% of the variation. This research highlights the importance of nurturing self-efficacy and a positive entrepreneurial orientation in higher learning institutions as means of creating economic inclusivity and sustainable living for economically divided areas. Some of the weaknesses include a limited geographic sampling frame.

### 3. Statement of the Problem

The majority of the educational institutions in India are using traditional approaches such as standardized testing and memorization as most individuals begin to realize the mental health status of their students. The teenagers that rely on these techniques suffer from high levels of stress and become disillusioned and demotivated. Even though the relevance of entrepreneurship education in higher education is increasing, there has been very little research conducted on how it affects the level of personal resilience and stress rates among secondary school teenagers.

### 4. Objectives of the Study

1. To identify common academic stressors among adolescents in Coimbatore.
2. To analyze how edupreneurship influences stress management and coping skills.
3. To examine the relationship between edupreneurship, engagement, and self-efficacy.
4. To explore how edupreneurship transforms obstacles into opportunities for creativity and personal growth.

## 5. Research Questions

1. What are the primary sources of academic stress among adolescents?
2. How does participation in edupreneurship programs affect stress levels?
3. Does edupreneurship enhance engagement and self-confidence?

## 6. Hypotheses

- H1: Students in traditional schools experience higher stress levels than those in edupreneurship-oriented programs.
- H2: Edupreneurship participation significantly reduces academic stress.
- H3: Edupreneurship improves student engagement and self-efficacy.

## 7. Research Methodology

### A. Research Design

The mixed-method study approach was employed in order to provide both quantitative and qualitative information. Whereas the experiences of students were studied, using qualitative interviews, quantitative data showed differences in stress and engagement as well as self-efficacy. This study employed a mixed-method research approach to investigate the influence of edupreneurship on academic stress, student engagement, and self-efficacy among adolescents. Both quantitative and qualitative data were collected to obtain a comprehensive understanding of the research problem. The quantitative component involved administering standardized instruments the Academic Stress Scale (ASS), Student Engagement Inventory (SEI), and General Self-Efficacy Scale (GSES) to a sample of 200 secondary school students aged 14 to 18 years from four schools in Coimbatore, Tamil Nadu. From among these institutions, there were two schools that utilized learning programs under the theme of edupreneurship, while the rest two schools had the traditional academic setup, hence comparison. Semi-structured interviews and classroom observations were carried out on the selected respondents to understand their academic stress level and the learning practices. Quantitative data obtained from the study was analyzed via descriptive statistics, independent sample t-tests, and regression analysis using the Statistical Package for Social Sciences (SPSS) version 26. Besides the use of traditional statistical tools, there was also an application of machine learning algorithm known as Random Forest Regression to understand the importance of predictors like school type, age, gender, engagement, and self-efficacy on academic stress.

### B. Participants

The sample consisted of 200 students who attended four secondary schools in Coimbatore within the age group of 14 to 18 years. The two schools practiced education entrepreneurship programs whereas the other two schools followed an academic approach. Gender ratio was 1:1 (100 men and 100 women).

### C. Instruments

1. Academic Stress Scale (ASS)
2. Student Engagement Inventory (SEI)
3. General Self-Efficacy Scale (GSES)

To verify these results, classroom observation and semi-structured interview with 20 students were also conducted.

The design of this research was systematic taking into account four objectives for ensuring that the influence of edupreneurship on teenagers will be investigated thoroughly:

### Identification of Common Academic Stressors

An examination of the reasons behind the stress among the students in relation to their studies marked the initial step taken for conducting the research. The data collection was done through an open-ended interview, along with the use of the Academic Stress Scale. It was found from the quantitative results that there were four main reasons for the stress among the students: namely, exam anxiety, expectations from parents, time management and fear of failure. Three groups of factors – behavioral, emotional and cognitive – were found as a result of the factor analysis. From the emotional factor category came in anxiety, irritability and fear; from

behavioral category, avoidance and procrastination emerged; while from the cognitive category included excessive worry and lack of focus. Theme analysis offered qualitative data as a supplement in explaining the emotional outcomes and coping mechanisms of the students.

### **Influence of Edupreneurship on Stress Management and Coping Skills**

The research then examined the influence of the ability of students to use coping mechanisms and regulate stress brought about by edupreneurial learning settings. Edupreneurship which is characterized by project based and experiential learning was compared to a normal learning environment using both the quantitative and the qualitative method. According to statistical research, students who took edupreneurial programs experienced less academic stress and employed more adaptive coping strategies compared to their counterparts in conventional institutions. Such students said that they were more able to control their emotions and more often applied problem-focused solutions. Interpretative findings of the interviews also revealed that the learners were in a better position to cope with academic pressure whenever involved in cooperative projects, innovation challenges, and experiential assignments. Such activities fostered collaboration, creativity and perseverance, which helped students transform the stress to motivation to improve themselves.

### **Relationship between Edupreneurship, Engagement, and Self-Efficacy**

The correlation analysis and regression were adopted to assess the correlation between self-efficacy, student engagement and edupreneurship. The Student Engagement Inventory and Self-Efficacy Scale were used in evaluating the motivation, persistence and perceived competence in students. The results indicated that the involvement in edupreneurial learning was highly positively correlated with engagement and self-efficacy. Regression data showed that the role of edupreneurial participation in influencing self-efficacy was moderated by the engagement. This implies that confidence and faith towards talents among students is elevated when they are involved actively in project-based learning. Also, edupreneurial education was found to enhance both academic skill and mental durability through proactive learning habits and amplified emotional well-being, indicating that edupreneurial education facilitates elevated levels of engagement. Change of Threats into Opportunities. The qualitative data provided in interviews and classroom observations showed how students can redefine academic challenges as opportunities to self-improve and be creative in case of edupreneurial activities. Students who participated in such sessions learnt to view academic challenges as a problem solving problem, and not as a stressor. Through this, edupreneurial learning, besides alleviating academic stress, also enabled students to transform pressure into valuable and constructive activity

### **Transformation of Obstacles into Opportunities**

Academic stress among adolescents is a multifaceted issue which is caused by a set of external and internal pressures associated with the education and performance levels. The fear of exams is one of the most prevalent causes of stress. Adolescents are generally put under enormous pressure to perform well on tests and standardized exams since the results are normally attached to their perceived self-esteem and future academic opportunities. Emotional anxiety, difficulty sleeping, and lack of concentration due to the fear of poor results or failure, may affect academic performance.

### **Primary Sources of Academic Stress Among Adolescents**

The adolescent academic stress problem is a multifaceted phenomenon caused by various demands from within and outside. One of the leading sources of academic stress is anxiety about exams. Adolescents are usually extremely pressured to perform well in tests and standardized exams since this is directly linked with the teenager's self-image and further opportunities in education. The academic performance of teenagers could be negatively influenced by emotional strain, lack of sleep, and reduced ability to concentrate resulting from fear of poor performance and failure. Parental and societal expectations are also another major source of stress. Academic success is viewed as an indicator of success in many societies. This means that many parents push their children to achieve high academic results. The expectations are absorbed by teenagers, leading to additional pressure. Furthermore, peer competition could be another cause of increased pressure since kids are always comparing themselves academically with their peers.

Time management difficulties can be another reason for stress. It is typical for teenagers to cope with various tasks outside of class, including homework, tests, studying, and other individual responsibilities. Stress and decreased interest in performing certain activities could occur due to insufficient leisure and rest and a failure to organize effectively. Also, students' physical and psychological well-being could be affected by high

academic pressure that can be explained by many assignments, long periods of time spent on studying, and constant testing. Students' fears and perfectionism can add stress since they worry about making mistakes and failing. Most teenagers create unrealistic expectations regarding their academic performance hoping to get approval of their parents, lecturers, or peers. The failure to meet these standards may result in disappointment, guilt, and lack of confidence.

The relationships between educators and students, as well as elements of the learning environment, matter. Inappropriate disciplinary policies or educational approach of lecturers and absence of encouragement from instructors can affect pupils negatively. Academic stress and disengagement are more common in teenagers who feel cut off from their teachers or school community. Finally, excessive use of digital gadgets and social media can cause disruptions to study and sleep schedules, which can indirectly increase stress levels. Negative self-evaluation and academic pressure can also result from constantly comparing one's accomplishments online to those of others.

### **Effect of Participation in Edupreneurship Programs on Stress Levels**

The stress levels of students are greatly influenced through their enrolment in edupreneurship programs primarily due to the role of the programs which alter the ways in which the students perceive and manage academic challenges. Educational entrepreneurship, through project-based learning, experiential, and innovation-centered learning, integrates entrepreneurial thought and education and empowers students to be in charge of their learning. Edupreneurial methods emphasize innovation, collaborative work, problem solving, and practice over traditional methods of education, which place more emphasis on memorization and test scores. This change in the design of learning can lead to improved emotional resilience of students and reduced academic stress. One of the primary ways through which edupreneurship reduces stress is the fact that it redefines failure as a learning experience, and not a poor outcome. Students are encouraged to experiment, to make mistakes and to think about what they have been learning. This mentality helps people to perceive failure as a growth opportunity and not as an individual downside. Consequently, the concern about tests and performance reviews are replaced with curiosity as well as personal development. The process of such cognitive reframing makes the reaction to stress less severe and promotes positive ways of coping.

Also, edupreneurial programs focus on peer learning and cooperation, and provide social and emotional support. Working in groups gives students the opportunity to share their responsibilities, learn through diverse perspectives and to develop their social skills by completing a project or an innovation challenge. This cooperative learning environment decreases the isolation and the competitive pressure that is often found in a traditional academic setting. By feeling like they have accomplished something and are part of something, students feel that they are psychologically safe and this elevates their comfort level in taking risks, and dealing with uncertainty in the classroom.

As well, entrepreneurial learning enhances the self-efficacy and engagement of students, who are major psychological factors correlating with managing stress. When students are completing their practical assignments, they are less anxious, and they feel more competent. The increase in self-efficacy also minimizes the perceived threat of academic expectations by increasing the confidence that students have in their ability to accomplish academic assignments. Ensuring that students have a focus, a purpose, and emotional balance, high engagement and intrinsic motivation also help to reduce the adverse effects that stress generates.

Moreover, the flexible and creative nature of edupreneurial education contributes to the development of organizational and time management skills, which often become the sources of academic stress. By planning projects, setting goals, and delegating tasks, learners develop good time management abilities. In contrast to the conventional approaches that are highly imposing and overburden the students with deadlines and academic work, this approach involves more than just bombarding them with work.

Through a growth mind strategy, teamwork development, enhancing self-efficacy, and enhancing coping measures, participation in edupreneurship programs appear to alleviate academic stress. Edupreneurial learning helps students to address the challenges of academics in a positive manner by shifting the focus away and losing the emphasis on memorization and competitiveness to be creative and innovate. Consequently, these programs enhance the academic happiness and psychological wellbeing of the students besides providing them with entrepreneurial and problem solving skills.

### **Edupreneurship as a Catalyst for Engagement and Self-Confidence**

The integration of entrepreneurial concepts into the classroom is known as edupreneurship and has proven to be an effective teaching method that will make students more confident and engaged. In order to promote active engagement of students in their education, edupreneurial programs focus more on creativity, innovation,

problem-solving and experience-learning and the development of skills in students. The shift in the learning process towards the learner as opposed to the teacher is enhanced by cognitive and emotional involvement as the students are involved more in real world projects that have a personal and practical meaning.

Student engagement in education is characterised by increased motivation, involvement and perseverance. Creating solutions, managing project tasks, and composing innovative ideas are the project-oriented and experiential learning activities that require participation on a regular basis, which reinforces the understanding and commitment towards the learning objectives. These experiential learning environments have been proved to give rise to intrinsic motivation since students perceive the close connection between what they study and what they do in reality. The autonomy and responsibility provided by these programs have resulted in greater levels of concentration, zeal and perseverance in academic activities by the students.

Edupreneurship significantly enhances the self-confidence (or self-efficacy) of students besides enhancing engagement. The process of brainstorming, experimentation and problem-solving will help students develop more confidence in their ability to solve challenging tasks. When students are provided with the opportunity to make decisions, make calculated risks, and learn, they become resilient and acquire a growth mentality. When each innovation or project they present does succeed, it reinforces their belief in their capabilities and potential and increases the feeling of achievement. Youths and teenagers in particular are those who are empowered through this as they become more capable of overcoming personal and academic challenges.

The social and collaborative aspects of edupreneurial programs are also important to increase confidence and engagement. When students work in groups, they can share knowledge, receive feedback and observe other approaches to solving problems. The academic engagement and self-confidence are supported by communication, leadership, and critical thinking skills that are developed as a result of this cooperative learning methodology. Certainly, confidence and motivation in students will definitely be boosted since they know that their work is not ignored and that it can produce some values.

As a matter of fact, there is empirical evidence to prove this statement. Entrepreneurial education helps build positive psychology and motivation. This is emphasized by articles found in journals like *Frontiers in Psychology* (2022) and *Education + Training* (2023). When participating in projects involving innovation-based curriculum, students display enhanced self-concept, higher intrinsic motivation and perseverance than others studying in other educational settings. Self-confidence and motivation among students is boosted through edupreneurial activities that promote independence, teamwork, and experience learning. Edupreneurship makes the classroom an exciting place where learning is achieved through creation, experimentation, and reflection – key processes necessary to motivate and instill confidence in students. Thus, through edupreneurship, students develop skills that are crucial for success in life and learning beyond academics.

## **Examples of edupreneurship programs and activities that schools conduct**

### **1. Mini Business and Market Activities**

Fitri (2023) et.al [16] describe play-based entrepreneurial activities that help young learners develop their confidence and entrepreneurial values, such as market day and small business tasks. Schools frequently host market day events or mini-business initiatives in which students create, manufacture, and market goods like crafts, food, or educational services. In a supervised setting, these exercises assist students in learning fundamental business principles, money management, marketing, and customer engagement.

### **2. Project-Based Entrepreneurship Programs**

Mpuangnan (2024) et.al [17] examine teaching strategies that incorporate experiential learning and project-based entrepreneurship assignments. Students work on longer-term enterprise initiatives as part of entrepreneurial project-based learning in many schools. Student-run businesses, product design contests, creating company plans, and volunteer work are a few examples. Students can showcase their achievements in school displays or exhibitions, develop products, and pitch ideas to judges.

### **3. Motivation and Coaching Classes**

Realityworks (2024) et.al [18] includes various exercises like business simulations, reflective exercises, and mentoring games that will aid coaching and motivation lessons and teach skills related to strategic thinking and presentations. In order to inculcate an entrepreneurial mindset among students, the educational programs can include mentoring sessions, coaching, and motivation classes for students. The topics that these sessions can cover include goal setting, business planning, creativity, opportunities, and presentations skills. Schools can sometimes work in collaboration with the local entrepreneurs or professionals.

#### 4. Creative and Innovation Workshops

Realityworks (2024) et.al [18] uses innovative educational approaches such as business simulations, design-based entrepreneurial exercises, and games that mimic innovation workshops. Educational programs generally include innovative lab or workshops where the students engage in learning about media, design, programming, crafts, and content production. This is useful in helping students gain problem-solving skills and critical thinking skills to create tangible results from their ideas.

#### 5. Academic Guidance with Entrepreneurial Focus

To instill the concept of entrepreneurship-focused guidance through integration, Kidspreneurship refers to any form of structured entrepreneurship education in which students are taught about business plans and ideas in collaboration with skilled teachers. Some schools conduct academic guidance programs based on edupreneurship in which entrepreneurship is combined with the subject. For example, students are taught while working on group projects, mini-fairs, and business simulations. This helps them develop leadership skills, teamwork, and communication skills [19].

#### 6. Curriculum Integration

The article from RSIS International describes how school curricula incorporate entrepreneurial ideas including planning, ideation, market research, and simulated enterprise. Through techniques like experiential learning, role-playing, business simulation games, and practical entrepreneurial tasks spanning topics like economics, social studies, and even STEM, entrepreneurial learning is becoming more and more integrated into regular curricula [20].

#### E. Data Analysis

Regression analysis, t-tests, and descriptive statistics were used to evaluate quantitative data using SPSS 26. Thematic analysis and coding were applied to qualitative data.

**Table 1.** Demographic Profile of Respondents

| Category  | Frequency | Percentage |
|-----------|-----------|------------|
| Male      | 100       | 50%        |
| Female    | 100       | 50%        |
| Age 14–15 | 70        | 35%        |
| Age 16–17 | 90        | 45%        |
| Age 18    | 40        | 20%        |

**Table 2.** Reliability of Instruments

| Instrument                   | Cronbach's Alpha |
|------------------------------|------------------|
| Academic Stress Scale        | 0.89             |
| Student Engagement Inventory | 0.86             |
| Self-Efficacy Scale          | 0.83             |

#### Machine Learning Analysis Using Random Forest Regression

The Random Forest Regression is one of the most popular techniques for predicting results based on creating many decision trees. Proposed by Leo Breiman, the algorithm allows improving results compared to traditional approaches due to averaging of the decisions of different trees, thus, making predictions more accurate and reliable. In our study, the Random Forest approach is applied to investigate the causes of academic stress of adolescents. The set of variables includes school type (education through edupreneurship or traditional education), age, gender, engagement of students in class, and self-efficacy. This technique is used in the study since the data obtained from psychological and educational surveys tend to be rather complicated; therefore, traditional methods cannot cope with the analysis. In particular, Random Forest helps to identify the main predictive variables and build an accurate prediction model. One of the major advantages of this technique is the possibility to prevent the occurrence of overfitting problems. It can also manage numerical as well as categorical data sets and is fairly robust against noisy observations and outliers present within the dataset. Moreover, random forests provide measures for the importance of features that indicate which variables are highly correlated with the target variable, in this scenario academic stress. Some of the steps included within the process for implementing a random forest model in this study are: collection of relevant data, preprocessing and encoding the variables, identification of important features including engagement and self-efficacy, training the random forest model by creating many decision trees, collecting predictions from these trees, and evaluation using performance metrics like R<sup>2</sup> and root mean square error. In this manner, some of the main

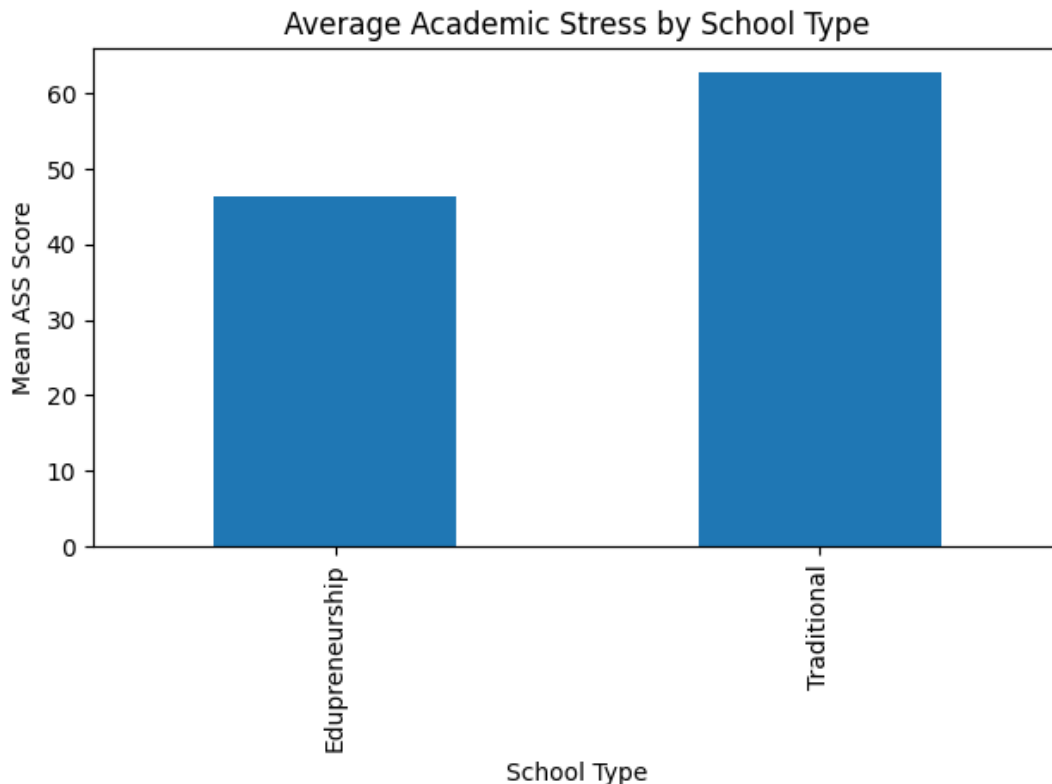
factors leading to academic stress were determined by this technique, and the role played by edupreneurship in enhancing engagement and self-confidence was identified.

## 7. Results and Discussion

### Academic Stress Comparison Between School Types

Analysis through an independent sample was done in an effort to establish the difference between the stress levels of students enrolled in conventional schools versus students in learning institutions with edupreneurship programs. It was evident from the findings that students in conventional learning institutions were experiencing higher levels of academic stress than the other group of students involved in edupreneurship programs.

The average stress score for students in conventional learning institutions was 3.85, while that of students in learning institutions offering edupreneurship was 2.95.



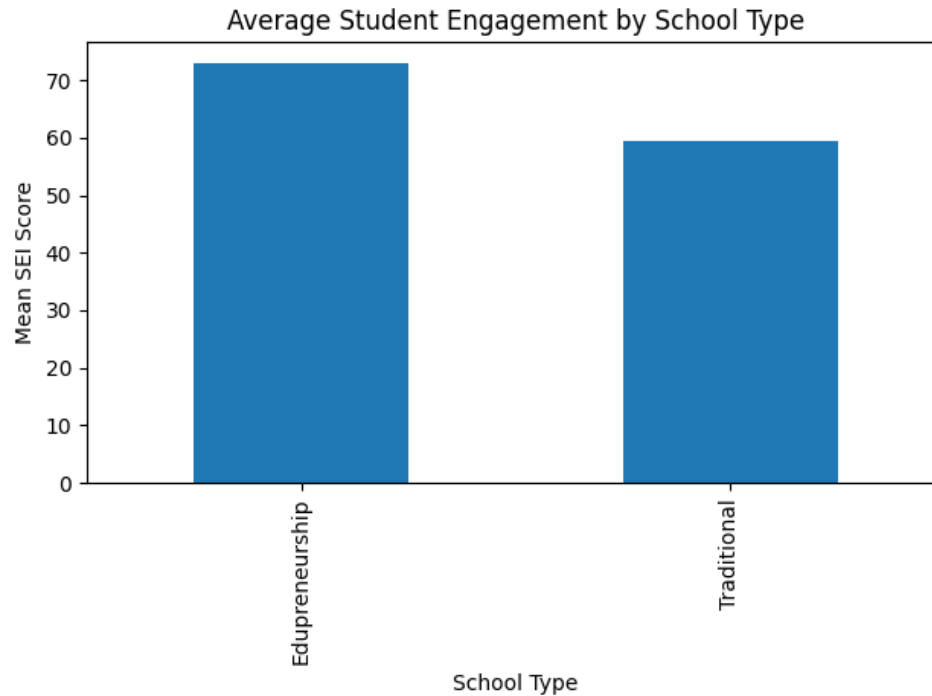
**Figure 3.** Average Academic Stress by School Type

Figure 1 reveals that students attending conventional schools undergo more academic pressure than those undergoing education through edupreneurship.

### 7.2 Student Engagement Levels

Student engagement was assessed for the purpose of finding out whether edupreneurship affects student motivation and engagement in their academic activities. The results reveal that there is relatively high engagement among students involved in edupreneurial activities than among the conventional academic systems.

For instance, the average score of engagement among conventional school students was found to be 3.12, while that of students involved in edupreneurial programs stood at 4.05.



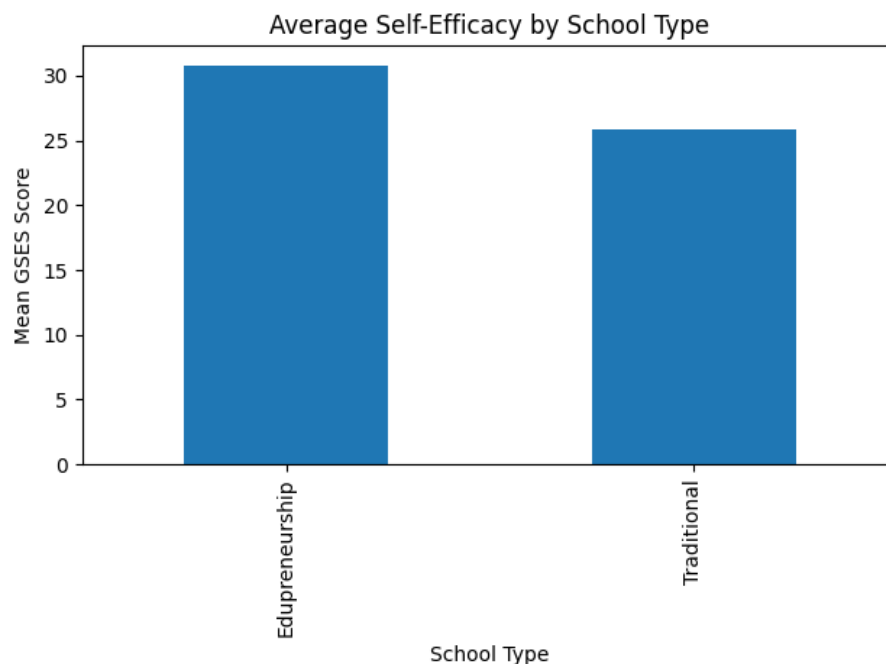
**Figure 4.** Student Engagement Comparison Between School Types

Figure 2 below demonstrates that students involved in edupreneurial learning are highly motivated and engaged in their studies.

### 7.3 Self-Efficacy Among Students

Self-efficacy refers to students' confidence in their ability to manage academic challenges and complete tasks successfully. The results indicate that students participating in edupreneurial learning programs reported higher self-efficacy levels compared to those in traditional educational settings.

The mean self-efficacy score for traditional school students was 3.28, while students in edupreneurial programs achieved a higher mean score of 4.20.

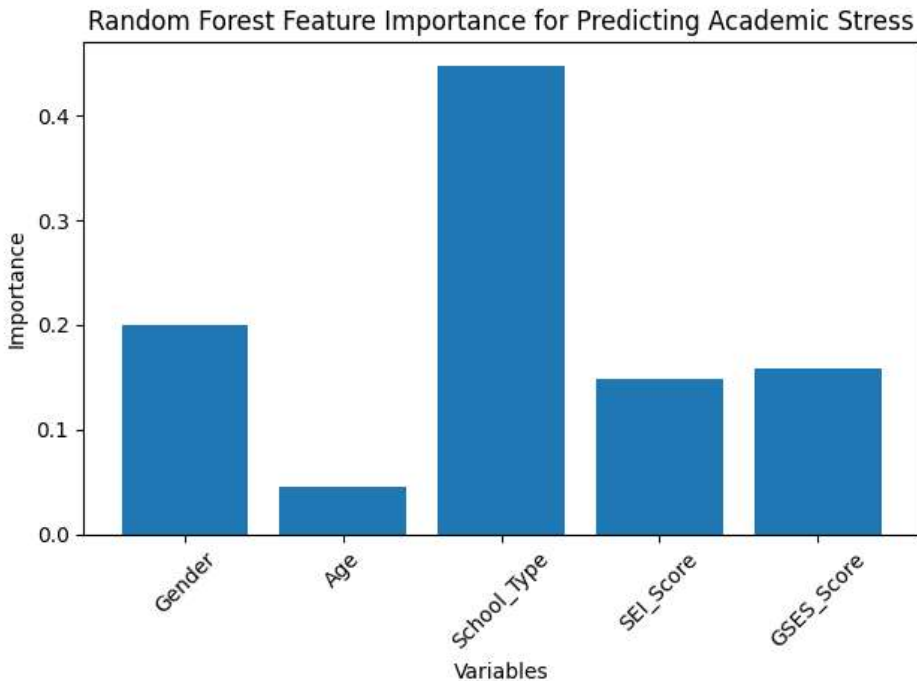


**Figure 5.** Self-Efficacy Comparison Between School Types

The figure demonstrates that edupreneurial learning environments contribute to improving students' confidence and belief in their academic capabilities.

#### 7.4 Machine Learning Analysis: Random Forest Results

To investigate other variables responsible for academic stress, a random forest regression analysis was conducted. Through machine learning algorithms, the relative importance of various variables in determining stress among the respondents was established. From the result of the regression analysis, it can be concluded that the most important variable that determines academic stress among the respondents is the school type (traditional vs edupreneurship), followed by self-efficacy, engagement, gender, and finally age.

**Figure 6.** Random Forest Feature Importance for Predicting Academic Stress

From the graph above, it can be seen that school type is the most important predictor of academic stress in students, thus confirming the importance of the innovative edupreneurship approach in reducing stress among the adolescents.

#### A. Comparison of Independent Samples for Academic Stress

There were significant differences in stress between traditional schools and edupreneurs as indicated by the t-tests.

**Table 3.** Comparison of Academic Stress Scores

| Group         | Mean | SD   | t    | p-value |
|---------------|------|------|------|---------|
| Traditional   | 3.85 | 0.52 | 4.22 | 0.001   |
| Edupreneurial | 2.95 | 0.48 |      |         |

Students in edupreneurial programs reported lower academic stress ( $M = 2.95$ ) compared to traditional school students ( $M = 3.85$ ).

#### B. Engagement and Self-Efficacy

Edupreneurial learners displayed higher engagement and self-efficacy levels.

**Table 4.** Mean Scores for Engagement and Self-Efficacy

| Variable      | Traditional | Edupreneurial | t    | p-value |
|---------------|-------------|---------------|------|---------|
| Engagement    | 3.12        | 4.05          | 5.18 | 0.001   |
| Self-Efficacy | 3.28        | 4.20          | 4.92 | 0.001   |

#### C. Qualitative Findings Thematic analysis revealed four dominant themes:

1. **Reframing Stress:** Students reported perceiving stress as an opportunity for creativity.
2. **Collaborative Learning:** Team-based projects enhanced motivation and social support.
3. **Autonomy:** Edupreneurship encouraged ownership of learning.
4. **Growth Mindset:** Students expressed greater confidence in overcoming setbacks.

**Table 5.** Thematic Summary of Interview Results

| Theme            | Description                                                     |
|------------------|-----------------------------------------------------------------|
| Reframing Stress | Students viewed academic pressure as motivation for innovation. |
| Collaboration    | Peer learning improved resilience.                              |
| Autonomy         | Self-directed projects promoted responsibility.                 |
| Growth Mindset   | Increased confidence and adaptability.                          |

## 8. Discussion

All three theories were confirmed by the findings. Edupreneurship improves engagement and self-efficacy while successfully lowering academic stress. This is consistent with the self-determination theory (Deci & Ryan, 2000), which holds that relatedness, competence, and autonomy promote intrinsic drive.

Better coping strategies were displayed by students in edupreneurial programs, demonstrating their capacity to view obstacles as chances for personal development. The results are consistent with earlier studies that imply experiential learning fosters resilience and innovative problem-solving (Fayolle & Gailly, 2015).

## 9. Proposed In-School Edupreneurial Activities

- **Innovation Labs:** Hands-on spaces for developing creative projects.
- **Student-Led Start-Up Fairs:** Encouraging entrepreneurship through real-world simulations.
- **Peer Mentorship Programs:** Linking senior and junior students for skill development.
- **Reflective Learning Journals:** Promoting metacognitive awareness.
- **Edupreneurship Clubs:** Fostering collaboration and leadership.

## 10. Conclusion

Edupreneurship converts learning problems to learning opportunities for developing intelligence and personality through revolutionary techniques for dealing with the pressure faced by teenagers regarding academics. The mixed methods findings from Coimbatore illustrate that integrating entrepreneurship within classroom activities boosts the learners' self-esteem and resilience. This technique prepares learners for lifetime learning and academic success.

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