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# Chief Editor's Note

## **Empowering Learners Through Governance, Innovation, and Digital Transformation**

Education today stands at a critical juncture, where rapid social, technological, and economic changes demand a fundamental rethinking of how learning systems prepare individuals for the future. This edition of the journal is guided by the transformative vision of the National Education Policy (NEP) 2020, which places equity, quality, skill development, and lifelong learning at the heart of India's educational reform agenda. The scholarly contributions brought together in this volume reflect this vision by examining how institutions, curricula, governance structures, and digital platforms can collectively shape a resilient and future-ready education system.

The articles in this issue address key dimensions of contemporary educational transformation. Themes such as leadership and governance, teacher professionalism through the National Professional Standards for Teachers (NPST), and the strengthening of school libraries underscore the importance of institutional capacity in sustaining meaningful reform. At the curricular level, analyses of NCERT textbooks and social entrepreneurship competencies highlight the growing need to integrate critical thinking, innovation, and vocational relevance within school education. These perspectives reaffirm that education must move beyond content delivery to competency development aligned with societal and workforce needs.

This edition also foregrounds learner experiences and digital engagement as central to educational quality. Studies examining digital access to skill training during the COVID-19 pandemic, sentiment analysis of the SWAYAM mobile application, and vocational interests among secondary school students provide valuable insights into learner aspirations and emotional engagement. Further, reflections on medical students' perceptions of the healthcare profession emphasize the necessity of aligning vocational education with realistic career pathways, ethical practice, and social responsibility.

Collectively, the research presented in this volume calls for a coherent and inclusive approach to education - one that bridges policy intent with classroom practice, aspiration with opportunity, and academic knowledge with real-world skills. As Chief Editor, I hope this edition serves not only as a scholarly resource but also as a catalyst for dialogue, innovation, and action among educators, researchers, policymakers, and practitioners. The future of education depends on our collective commitment to building systems that are adaptive, humane, and capable of empowering every learner to contribute meaningfully to society.

**(Dr. Deepak Paliwal)**  
**Editor In Chief**

*Indian Journal of Vocational Education*



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## **Digital Access to Success in Skill Training during Covid-19 in Delhi & NCR**

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### **Abstract**

The COVID-19 pandemic profoundly disrupted India's education and skill development ecosystem, compelling institutions to adapt rapidly to digital and blended learning models. The present paper investigates the access and success in skill training programmes during and immediately after the COVID-19 period in Delhi and the National Capital Region (NCR), focusing on demographic inclusivity, institutional response, and employment outcomes. Based on a primary survey of 505 trainees across 29 training institutions from 11 districts of Delhi and one district of NCR, the study employed descriptive and cross-tabulation analyses using SPSS.

Findings reveal that skill development initiatives were predominantly accessed by young learners (18–25 years), with balanced gender participation but unequal representation across caste and minority groups. Most participants belonged to low-income backgrounds and pursued short-term, technology-oriented certificate courses, reflecting the demand for quick employability. The pandemic significantly increased enrolment in skill programmes while accelerating digital adoption; however, offline and blended modes remained dominant due to limited online readiness and infrastructural constraints. Although 91.9% of learners had internet access, dependence on smartphones and mobile data restricted the depth of digital engagement.

Employment outcomes were encouraging, with 77.8% of trainees securing jobs, primarily through institutional placements, though job vulnerability persisted. Online assessments improved credibility yet excluded digitally disadvantaged groups. The study concludes that while COVID-19 catalysed innovation and expanded access to vocational education, structural inequalities, limited digital infrastructure, and modest career aspirations continue to constrain the transformative potential of India's skill ecosystem. Strengthening inclusivity, pedagogical design, and digital resilience remains vital for sustainable skill development in the post-pandemic era.

**Keywords:** Skill Development, COVID-19, Digital Learning, Vocational Education, Employability, Delhi NCR.

## **Introduction**

India has steadily evolved into a knowledge-driven economy, powered by its capable, adaptable, and highly qualified human capital. In the context of growing globalisation, the country's young workforce offers immense potential for India to carve out a distinctive position on the global stage. Maqbool & Khan (2019) defined a skill development programme as proficiency that is acquired or developed through training or experience, which strengthens the ability of individuals to adapt to changing market demands and helps benefit from innovation and entrepreneurial activities. It is widely recognised that skill development not only strengthens individuals' capacity to work but also expands their career opportunities, fostering greater creativity and job satisfaction (Jena, 2024). Consequently, vocational education and training (VET) have gained significant importance in recent years, both at the national and global levels. In this context, the broader framework of technical and vocational education and training (TVET) has emerged as a key instrument of social policy in many countries.

The outbreak of the COVID-19 pandemic in late 2019, originating in Wuhan, China, quickly escalated into a global health emergency and was declared a pandemic by the World Health Organisation (WHO, 2020). India reported its first case of COVID-19 in January 2020, and within weeks, the virus spread across states, forcing the Government of India to impose a nationwide lockdown in March 2020. The lockdown, while necessary to contain transmission, brought the country's social and economic activities to a sudden halt. Due to the outbreak of COVID-19, significant disruption has been caused in social, cultural, economic and environmental dimensions of life. The COVID-19 pandemic has had a profound impact on economies and societies worldwide, resulting in an unprecedented decline in economic activity, a loss of working hours and income, and a sharp rise in unemployment and underemployment (Chun, H. K. et al., 2021). Among the sectors most severely affected, education bore a particularly heavy burden due to its dependence on face-to-face interactions and physical infrastructure (Jena, 2024).

The closure of schools, colleges, and universities across the nation disrupted the education of nearly 320 million learners, according to UNESCO estimates (UNESCO, 2020). Academic calendars were thrown into disarray, examinations were postponed or cancelled, and millions of students faced uncertainty about their educational progression and career prospects. The sudden shift from physical to digital modes of learning became the most significant adaptation during this crisis. Still, it also exposed the structural inequalities and digital divide within the country (Azim Premji Foundation, 2021).

On a positive note, the COVID-19 pandemic accelerated digital transformation in education, highlighting the significance of blended learning models. It compelled policymakers and institutions to reimagine curricula, pedagogy, and the integration of technology to make education more resilient and inclusive. Introduced during this period, the National Education Policy (NEP) 2020 placed strong emphasis on digital learning, flexibility, and skill-oriented education, aligning closely with the evolving needs of the post-pandemic era (Government of India, 2020).

Though the COVID-19 outbreak brought unprecedented disruption to India's education sector, it amplified existing inequalities while also opening new opportunities for reform and

innovation. The crisis highlighted the urgent need to strengthen digital infrastructure, invest in teacher training, and develop inclusive strategies to ensure that education remains equitable, resilient, and future-ready in the face of such global challenges and TVET was also no exception to this.

## **Rationale of the Study**

A survey conducted among TVET providers, policymakers, and social partners revealed that 90 per cent of respondents reported complete closure of TVET centres in their countries due to the pandemic and related government containment measures (Chun, H. K. et al., 2021). In 114 out of 126 countries, respondents confirmed widespread closures, indicating that the majority of TVET institutions across the globe were significantly disrupted. In most countries, respondents noted a shift towards remote training measures to ensure continuity of training; however, the survey results highlighted the unpreparedness of TVET systems to face this challenge (Chun, H. K. et al., 2021). Many skill training centres were closed because they could not provide online training. It is a fact that the global outbreak of COVID-19 affected nearly all countries and territories, with profound implications for the education sector. Many schools, colleges, and universities were compelled to discontinue face-to-face teaching, creating an urgent need for innovative and alternative approaches to education and assessment. At the same time, the pandemic has opened avenues for accelerating digital learning (GoI, 2020). Government reports indicate that India has experienced a steady increase in qualified IT professionals, with industries adopting remote work and cloud infrastructure as key strategies for resilience and sustainability.

Several service sector industries, including automotive, construction, finance, logistics, and leisure, suffered severe setbacks during the pandemic. Small and medium enterprises were among the hardest hit by prolonged lockdowns and stringent containment measures. The healthcare sector also struggled to meet the demands of India's vast population, while travel restrictions disrupted numerous businesses across the country. Even the fast-growing IT sector experienced a slowdown, with hiring rates declining compared to the previous years. While the crisis took control of lifestyle and commerce in India, the tireless efforts of citizens and the government prevented more harm in the country than experienced globally (India Skill Report, 2021).

The COVID-19 pandemic accelerated the adoption of digital learning in India and worldwide. With physical training centres closed, digital platforms emerged as the primary medium for skill development, underscoring the promise of blended learning models that integrate online instruction with hands-on practice (ILO, 2021). At the same time, the crisis has exposed persistent challenges, including the digital divide, inadequate infrastructure, and limited internet access in rural and marginalised communities, which continue to hinder inclusivity in technology-driven training (Jena, 2020). Nevertheless, the future of skill development lies in combining technology with traditional approaches. Digital tools provide scalability, flexibility, and efficiency, enabling wider access to training opportunities, including for learners in remote areas.

Globally, as economies shift toward automation and digitalisation, technology-enabled training become indispensable in preparing workforces for Industry 4.0. In India, with its large youth population, leveraging technology for skill training is both a necessity and an

opportunity to ensure employability, productivity, and global competitiveness. Although India's talent demand and supply are at the core of global economic activity, this has presented challenges to sustainable growth (Majumdar et al., 2020). During the pre-pandemic period, skill training was viewed as an opportunity for the nation's youth; however, the pandemic presented a new challenge to the system.

With this backdrop, the present study aims to find out the impact of COVID-19 on skill training programmes with reference to access and success across various social groups in Delhi and NCR region.

## **Methodology and Design of the Study**

It is well understood that the skill development programme would increase the workforce training requirements for both formal and informal sectors. Although it is a strategically positive step, it is essential to understand the reality of employment opportunities of students and workers who have undertaken various levels of skill training in accordance with the National Skill Qualification Framework (NSQF) Levels. The study aims to survey and gather primary data from selected target groups, including both government and private organisations, that are actively involved in vocational and skill development programmes. It also intends to collect such information from the organisations that are the training providers and identify their extent of involvement in providing training and placement opportunities during and post COVID-19 period, with reference to the years 2020 to 2023. The analysis of the study is based on primary source data collected through structured interview schedules for selected institutions engaged in skill training programmes and facilitation of placement opportunities to meet the aspirational levels of beneficiaries, i.e., trainees, during and post-COVID periods from 2020 to 2023. The study primarily employed the survey method to collect data in a structured format. In total, 505 respondents of 29 training institutions were reached out to for primary data collection across 11 districts of Delhi and one district of national capital region (NCR), who were actively undergoing skill training during the years 2020 to 2023. An attempt was also made to collect required information from the institution's records regarding their placement. While institutional data was collected from the 29 sample institutions, the trainee data was collected through personal interviews.

The descriptive statistics were used for data analysis. Cross-tabulation was used to analyze the relationship between the variables. It is a valuable method to identify the relationship between two or more categorical variables. It helped to find relationship patterns and comparative analysis among different social groups. The cross-tabulation method was performed using the IBM SPSS Statistics Version 21 Software. A comparative analysis of respondents across social groups (Caste, Gender, Level of Education, Professional background, Family Income, and Religion) with respect to variables, such as suitable job opportunities during or after the Skill Training Programme on completion of skill training programmes.

The scope of the study was primarily to identify the status of skill training in Delhi, which has broad significance due to the city's unique socio-economic profile, its role as the capital of India, and its position as a hub for education, services, and employment. The study primarily aimed to examine the availability, accessibility, and effectiveness of skill development initiatives implemented by government bodies, private institutions, and

non-governmental organisations during and after the COVID-19 period. Since the skill training in Delhi spans multiple sectors, including information technology, healthcare, retail, construction, hospitality, and manufacturing, it was deemed appropriate to examine the training strategy adopted during and immediately after the COVID-19 period, transitioning to the new normal.

## Analyses & Major Findings

**A. Demographic Profile:** The demographic data collected in terms of age, gender, and social category in terms of broad caste category and religion are briefly presented below:

**Age:** The age distribution of respondents shows a pronounced skew toward younger participants. A large majority (91.5%) fell within the 18–25 years age group, while 7.9% were aged 26–35 years, and only 0.6% were between 36–44 years. This reflects the strong orientation of skill development programmes toward young people, positioning them as early-career interventions rather than mid-life or lifelong learning opportunities. Although around 8.5% of the samples are from the middle-aged group, this suggests that people still view skill development as an opportunity to upgrade their professional skills for the jobs they are performing or intend to perform.

**Gender:** Gender distribution within the sample was relatively balanced, though slightly female-dominant. Women constituted 54.7% of respondents, compared to 45.3% men. This pattern suggests encouraging trends in female participation in vocational education, although sustained support structures are required to ensure women's continued engagement and transition into the workforce. Delhi and NCR, being an urban area, participating in skill training is encouraging for making them economically self-reliant and empowered to sustain their family interests.

**Social Category:** Caste-based representation highlights a mixed but uneven picture of inclusiveness. Over half of the respondents (50.9%) identified as belonging to the General/Unreserved category, while 28.3% were from Other Backwards Classes (OBC) and 17.0% from Scheduled Castes (SC). Only 1.4% of respondents belonged to Scheduled Tribes (ST), and 2.4% were from minority groups, which fairly represents the population characteristics in the education sector. This distribution suggests that while OBC and SC groups had a notable presence, ST and minority representation remained disproportionately low, as Delhi has a smaller ST population, raising concerns about equitable access across marginalized communities.

**Religion:** The religious composition of the respondents was predominantly homogeneous, with 97.6% identifying as Hindu. Minority representation was minimal, with Muslims accounting for 1.8%, Sikhs 0.4%, and Christians 0.2% of the total. This reflects both the demographic characteristics of the study region and the limited participation of religious minorities in the surveyed skill development programmes, which are not commensurate with the population characteristics of Delhi and NCR.

**Summary of Findings -1:** The demographic data collected in terms of age, gender, and social category in terms of broad caste and religion line reveals that skill development initiatives are primarily accessed by young learners, reflecting their role as entry-level

pathways into the labour market. The balanced gender representation, with slightly higher female participation, is a positive sign of inclusivity but requires further institutional support to address systemic gender barriers. The uneven participation across caste and minority groups reveals persistent inequalities, suggesting that disadvantaged social groups may face structural and economic challenges in accessing training opportunities. Religious homogeneity further underlines the need for broader outreach to minority communities. Collectively, these patterns highlight both the strengths and limitations of skill development initiatives in achieving equitable representation during the COVID-19 period.

**B. Socio-economic Profile:** The socio-economic profile of the sample in terms of level of education, family income, professional background etc. briefly presented as below:

**Education:** The educational background of respondents reveals a concentration in mid-level qualifications. The majority (62.2%) had completed intermediate education, followed by 17.0% who were bachelor's degree holders and 16.0% who had completed high school. Only a small proportion reported holding a diploma or certificate (2.4%) or a postgraduate degree (2.4%). This indicates that skill training programmes are mostly accessed by those transitioning between secondary education and higher studies, rather than by school dropouts or highly qualified individuals seeking advanced reskilling.

**Income:** From a socio-economic perspective, the data highlights the significant role of income in shaping access to training. An overwhelming 92.5% of respondents belonged to the low-income group (low-income groups with annual family income up to ₹ six lakhs). At the same time, only a small minority fell into middle- or high-income categories. This suggests that skill development initiatives are particularly critical for economically disadvantaged groups, for whom vocational education creates a pathway to upward mobility.

**Professional Status:** In terms of professional status, a vast majority of respondents (95.8%) identified as students. At the same time, only a small proportion were engaged in formal employment, such as corporate jobs, teaching, or professional services. This confirms that skill training was primarily pursued by those preparing to enter the labour market, rather than by mid-career workers seeking retraining or upskilling opportunities.

**Summary of Findings -2:** The above-mentioned analyses show that skill development programmes tend to attract participants with intermediate (+2) or undergraduate qualifications, reflecting their positioning as a bridge between school and work. However, the limited representation of school dropouts or highly educated individuals suggests that the programmes may not be fully inclusive across educational strata. Socio-economically, the overwhelming participation of low-income groups underscores the importance of affordability and accessibility in programme design, as these learners are the most dependent on skill training for economic advancement. Often, it is argued that vocational education and skill training are the last resort for a student who cannot join formal higher education due to various reasons. Finally, the dominance of student participants illustrates the role of skill programmes as entry-level employability pathways but also signals the underutilization of such initiatives for mid-career reskilling.

### C. Programme Participation:

**Course Choice:** The analysis of programme participation reveals a clear pattern in the types of courses and institutions chosen by respondents. The most popular courses included Computer Operator and Programming Assistant (15.6%), Bachelor of Computer Applications (11.7%), and Early Childhood Care and Education (7.1%). This distribution reflects a strong inclination toward technology-oriented and service-related fields, highlighting their perceived relevance to employability in a rapidly changing labour market in an urban setup. However, the concentration in a few areas also suggests limited diversification of skill development pathways.

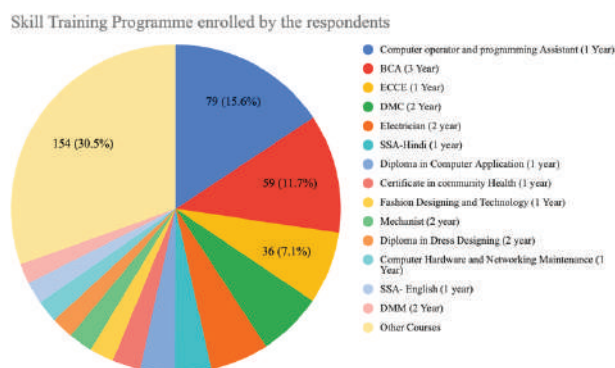


Figure 1.1: Skill Training enrolled by the respondents

**Institutional Choices for Enrolment:** In terms of institutional choice, 58.6% of respondents reported being enrolled in government-run institutes, while 41.4% attended private institutions. This suggests that government institutions remain the backbone of the skill training ecosystem due to the affordability and trust associated with public sector initiatives. At the same time, the significant share of private institutes underscores their complementary role in expanding access to training.

**Course Nature & Cost:** The nature of programmes pursued shows that short-term certifications dominated enrolment patterns, with 75.8% of respondents engaged in certificate courses, 13.1% in diploma programmes, and only 11.1% in degree programmes. This preference for certificates reflects the appeal of quick, skill-focused training that can provide immediate employability advantages. Yet, it also raises concerns about the depth and long-term sustainability of skills gained through shorter programmes.

Cost of training emerged as another critical factor. A large majority of respondents (87.1%) reported paying for their training, while only 12.9% accessed free courses. This reliance on fee-based models suggests that financial barriers persist for economically weaker participants, especially as most respondents came from low-income backgrounds.

**Access to Learning Resources:** Access to learning resources showed mixed results. While 65.7% of respondents received training materials, 34.3% did not. Among those who received materials, 73.1% reported having access to all necessary resources, 6.5% received only some, and 20.4% reported receiving none. This uneven provision of resources highlights disparities in institutional support and may have affected the quality and consistency of learning experiences.

**Summary of Findings -3:** In totality, the programme participation in terms of course choice, enrolment, course nature in terms of certificate, diploma etc. and their cost, training materials used reveals that programme participation during the study period was characterised by high demand for technology-driven and short-term certification courses, with government institutions playing a leading role in delivery. However, the heavy reliance on fee-based models and the uneven provision of training materials suggest that accessibility and equity remain critical challenges. The preference for quick, certificate-based training highlights learners' desire for immediate employability. Still, it also points to the risk of limiting long-term career development if more advanced and diversified options do not complement programmes. Overall, while participation levels were encouraging, systemic issues of affordability, inclusivity, and programme depth continue to shape the landscape of vocational training.

**D. Impact of COVID-19 on Enrolment and Training:** The impact of COVID-19 on enrolment, training methodology used, institutional adaptation is presented briefly as below:

**Pre-vs. Post-Pandemic Enrolment:** The data indicate that COVID-19 acted as a significant turning point in participation in skill development programmes. Only 16.6% of respondents were enrolled in such programmes before the pandemic, while a significant majority (83.4%) joined during or after COVID-19. This suggests that the pandemic served as a catalyst, drawing more learners into vocational education as they sought alternative career pathways and employability solutions in response to widespread disruptions in education and the labour market.

**Nature of Courses and Modes of Training:** The nature of courses pursued before the pandemic also highlights a distinct pattern; 91.1% of those enrolled before COVID-19 opted for short-term introductory computer courses, with very few diversifying into other fields. This intense focus on digital literacy demonstrates the perceived importance of computer skills even before online education became mainstream. Still, it also points to a lack of variety in pre-pandemic training options.

When examining the mode of training delivery, 82.2% of respondents reported continuing with offline and blended training even during the pandemic, while only 17.8% participated fully online. This finding is noteworthy, as it reveals that despite the widespread shift toward digital learning, institutions and learners continued to prefer in-person or blended formats. After restrictions eased, this trend became even more pronounced, with 95.4% of respondents returning to classroom-based training and only 4.6% continuing online. These figures highlight both a reliance on traditional learning environments and the limitations of digital delivery models in skill-based education.

**Institutional Adaptation:** Institutions also undertook measures to adapt during this period. More than half (53.7%) reported improving video conferencing infrastructure, while 38.2% upgraded both conferencing tools and digital equipment. A large majority (86.9%) also provided course extensions, ensuring flexibility for learners affected by disruptions. Notably, 99.6% of respondents were able to complete their programmes during the pandemic, reflecting strong institutional support and learner commitment despite the unprecedented challenges.

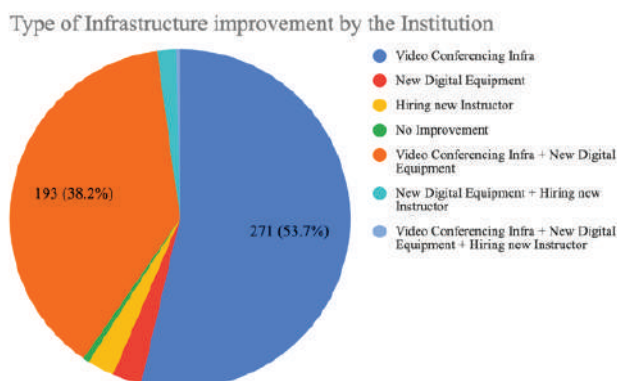


Figure 1.2: Type of Infrastructure improvement by the institution

**Summary of Findings -4:** The impact of COVID-19 on enrolment, training methodology used, institutional adaptation suggest that the pandemic not only expanded enrolment in skill development programmes but also reshaped the way training was delivered and managed. COVID-19 accelerated demand for vocational skills, especially in digital literacy, while also prompting institutions to invest in digital infrastructure and flexible policies. However, the heavy reliance on offline training/blended mode, even at the height of the crisis, underscores persistent barriers to effective online delivery and learners' preference for hands-on engagement. The exceptionally high completion rates reflect resilience, yet they also raise questions about the depth and quality of learning achieved under strained circumstances. Overall, COVID-19 acted as both a disruption and a transformative force, simultaneously exposing systemic weaknesses and driving innovation in skill development initiatives.

**E. Digital Readiness:** The survey results indicate that a large majority of respondents (91.9%) had access to the internet, though 8.1% still lacked connectivity, reflecting a persistent digital divide. Among those with access, most (86.5%) relied primarily on mobile data connections, while only 9.7% used private Wi-Fi and a negligible fraction used public networks. This dependence on mobile data highlights both the accessibility and limitations of digital participation, as unstable connections and high costs may have affected the quality of online learning.

In terms of devices, smartphone ownership was almost universal (97.2%), with Android-based phones dominating (96.2%). While this widespread penetration enabled learners to participate in mobile-based training, the low ownership of personal computers (34.3%) restricted the ability of many to engage with advanced, software-intensive, or multitasking training modules. Regarding platforms, Zoom (32.7%) and Google Meet (30.5%) were the most commonly used applications for online classes, while a further 28.5% reported using both. For sharing documents, WhatsApp emerged as the overwhelmingly dominant tool (95%), far ahead of platforms such as Telegram or Google Classroom. This reflects a firm reliance on informal but accessible digital practices rather than structured learning management systems.

Tools used by programmes for online classes

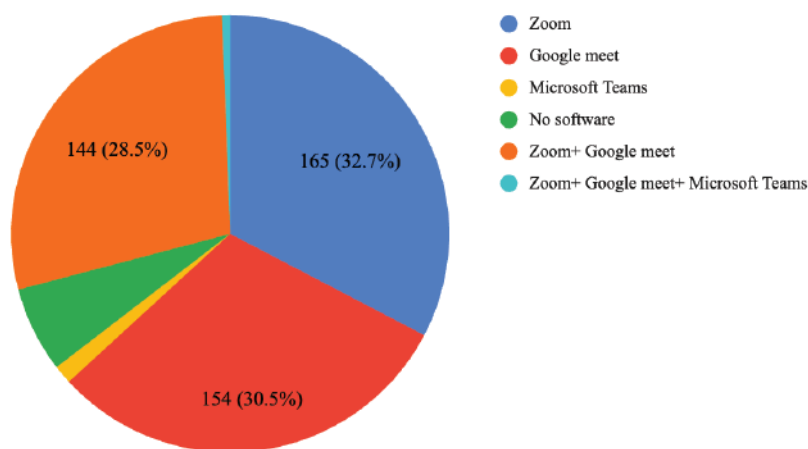


Figure 1.3: Tools used by programmes for online classes

**Summary of Findings -5:** The digital readiness suggests that while digital access was widespread in terms of connectivity and smartphone ownership, it was often shallow in terms of quality and depth. Heavy reliance on mobile data and smartphones made online training possible, but limited in effectiveness, especially for courses requiring advanced digital infrastructure. The dominance of WhatsApp and other informal tools highlights accessibility and ease of use but also indicates the absence of formal digital ecosystems tailored to structured learning. Overall, the results emphasize that digital readiness during COVID-19 was sufficient for basic participation but inadequate for ensuring equitable and high-quality online skill training.

**F. Assessments and Institutional Practices:** The data reveal that most respondents (68.7%) experienced both formative and summative assessments during their training, suggesting that institutions employed a balanced approach by combining continuous feedback with final evaluations. A smaller share reported experiencing only formative (22.2%) or only summative assessments (9.1%), highlighting some variation in institutional practices.

During the COVID-19 period, assessment processes shifted overwhelmingly to online formats, with 97.6% of respondents reporting online evaluations and only a tiny fraction experiencing blended (2.0%) or face-to-face (0.4%) assessments. Interestingly, even after the pandemic, 91.7% of assessments continued online, indicating that digital evaluation methods became institutionalized as part of the “new normal.”

In contrast, before COVID-19, most respondents did not clearly identify the mode of assessment, with a significant non-response suggesting either informal practices or limited awareness of formal assessment methods. This points to a lack of structured evaluation processes in the pre-pandemic period, which was subsequently formalised during the crisis. Furthermore, most respondents (90.9%) reported having undergone proctored examinations, which reflects a strong institutional emphasis on maintaining monitoring and credibility in assessments, even within digital environments.

**Summary of Findings -6:** The findings demonstrate that COVID-19 acted as a turning point in institutional assessment practices. While pre-pandemic evaluations were often informal or inconsistently applied, the crisis accelerated the adoption of structured, online, and proctored systems. This is not only a standardised assessment but also enhances the credibility and integrity of certifications. However, the heavy reliance on digital assessment methods may also have excluded learners with limited digital access, underscoring the need to balance inclusivity with rigor in future practices.

**G. Aspirations and Employment Outcomes:** The data highlights that respondents' aspirations for skill training programmes were varied but essentially modest in scope. Nearly half of the participants (49.5%) stated that their primary goal was simply to complete the programme successfully. Beyond completion, a significant portion aspired to secure government employment (21.6%), followed by private sector jobs (8.3%) and better career opportunities in general (5.1%). A smaller group expressed interest in pursuing higher education, entrepreneurship, or acquiring additional skills, reflecting more long-term or growth-oriented ambitions.

In terms of employment outcomes, the results were encouraging for majority of learners. A substantial 77.8% reported securing some kind of job after completing their training, while 22.2% were unable to do so. Notably, institutional mechanisms played a key role in bridging the gap between training and employment; 72.7% of those employed were placed directly through institutional support, while 27.3% secured jobs independently. This underlines the centrality of structured placement services linking training with labour market opportunities. Despite these positive outcomes, the impact of COVID-19 revealed the fragility of employment for trained workers. Nearly 28.7% of respondents reported losing their jobs during the pandemic, signaling that vocational qualifications did not fully shield individuals from broader economic shocks. Additionally, opportunities for entrepreneurship and alternative income generation were minimal, with only 2.6% reporting new income streams and just 0.6% relying on loans for job-related or financial support. This reflects limited systemic support for entrepreneurial pathways and restricted access to credit.

Respondent's aspiration from the skill training programme

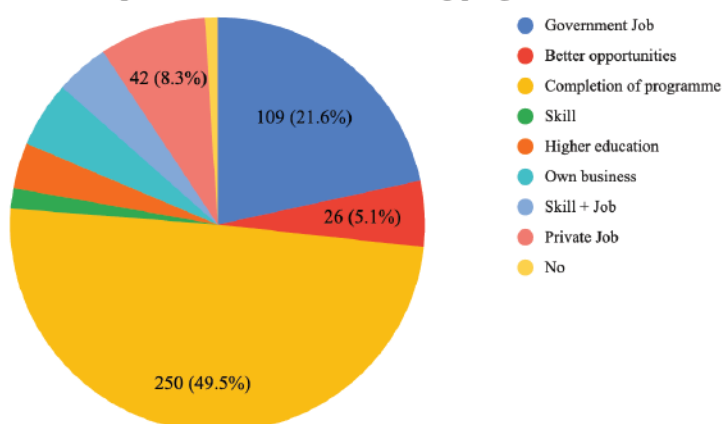


Figure 1.4: Respondent's aspiration from the skill training programme

**Summary of Findings -7:** The findings indicate that while skill training programmes were effective in securing employment for most learners, aspirations remained conservative, with certification and government jobs dominating priorities. Institutional placement support has emerged as a critical factor in ensuring job outcomes, highlighting the need for further strengthening of such mechanisms. However, the vulnerability of trained workers to job loss during COVID-19 highlights that skill programmes alone cannot guarantee employment security without broader structural resilience in the labour market. The low levels of entrepreneurship and financial risk-taking also suggest that skill development initiatives need to integrate better entrepreneurial training, financial literacy, and access to credit to create sustainable livelihood opportunities.

**H. Challenges in Online Training:** Significant difficulties marked the transition to online training during the COVID-19 pandemic for most respondents. An overwhelming 89.3% reported facing challenges, underscoring the fact that digital learning environments were far from seamless or universally effective. Among these, the most pressing concern was a combination of poor internet connectivity and difficulty in understanding concepts, cited by 40% of respondents. A further 23.2% highlighted compounded issues, including general discomfort, unstable connections, and conceptual clarity problems, which collectively hindered learning outcomes.

Motivational challenges were also evident, with 17.2% of participants reporting disengagement and a reduced willingness to participate actively in online classes. Alongside these dominant issues, several more minor but significant barriers emerged; 6.1% struggled with inadequate physical space for learning, 5.5% faced limitations in carrying out practical work, and 5.1% raised privacy and safety concerns during video-based interactions. In addition, 2.2% experienced eye strain from prolonged screen exposure, while 0.6% reported financial difficulties in managing online learning requirements.

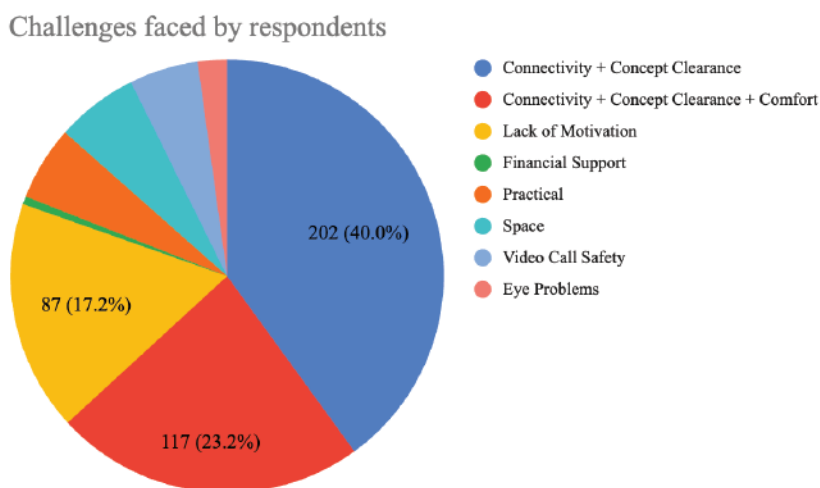


Figure 1.5: Challenges faced by respondents

**Summary of Findings -8:** These findings demonstrate that the challenges of online training during the COVID-19 pandemic were multidimensional, encompassing technological, pedagogical, psychological, and infrastructural barriers. Connectivity issues and lack of conceptual clarity reveal weaknesses in both digital infrastructure and instructional design. The motivational and emotional struggles further emphasise the human dimension of digital learning, which was often overlooked in the rapid shift to online learning. Minor yet persistent concerns, such as inadequate space, privacy, and eye strain, reflect how socio-economic and environmental factors have shaped the learning experience. Overall, the results indicate that while online training offered continuity during the pandemic, it was not inclusive or fully effective, highlighting the urgent need for better digital ecosystems, learner support mechanisms, and pedagogical innovations in skill development programmes.

## Conclusion

The study shows that skill development initiatives during COVID-19 were primarily accessed by young learners, serving as entry points to the labour market. Gender representation was relatively balanced with slightly higher female participation, though systemic barriers persisted. Participation across caste and minority groups remained uneven, highlighting structural inequalities and limited outreach. Training demand was concentrated on short-term, technology-driven certification courses, reflecting learners' need for quick employability. However, this approach risked limiting career growth without advanced options, as accessibility challenges, reliance on fee-based models, and uneven resource provision all contributed to equity issues.

COVID-19 reshaped programme delivery by accelerating digital adoption, yet offline and blended modes dominated due to barriers in online readiness and preference for hands-on training. Completion rates were high but raised concerns about learning depth. Digital access, while widespread, was shallow, with heavy reliance on smartphones, mobile data, and informal tools like WhatsApp, revealing weak formal digital ecosystems.

Assessment practices improved using structured online systems, enhancing credibility but potentially excluding digitally disadvantaged groups. Skill programmes supported employment, though aspirations remained conservative, with government jobs and certificates prioritised over entrepreneurship and job vulnerability highlighted labour market fragility. Challenges included poor infrastructure, instructional gaps, and psychosocial stress, underscoring the need for inclusive, resilient, and innovative vocational ecosystems.

In a nutshell, the following are the essential findings:

- a. Skill initiatives mainly served young learners; women's participation was slightly higher, but systemic barriers persisted.
- b. Caste and minority groups faced uneven access, showing deep-rooted inequalities.
- c. High demand for short-term, tech-driven certification courses risked limiting long-term growth.
- d. COVID-19 accelerated digital adoption, but blended/offline modes still dominated due to limited online readiness.
- e. Digital access was shallow, relying on smartphones, mobile data, and informal tools.
- f. Online assessments improved credibility but excluded disadvantaged groups.

g. Employment outcomes were positive but conservative, with a focus on certificates and government jobs.

h. Weaknesses in pedagogy, infrastructure, and learner support remained.

Thus, COVID-19 has transformed skill development by expanding access and digital adoption; however, deep inequalities, weak infrastructure, and limited career pathways continue to challenge its long-term impact

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### **Leadership and Governance in Education: Building Resilient Institutions**

Effective leadership is the foundation of sound educational administration. In a progressively dynamic and complex educational landscape, institutions are expected to acknowledge proactively to societal transformation, workforce requirement, and global educational trends. This calls for administrators who are both effective managers and visionary leaders, guiding institutions through change without compromising academic integrity or organisational stability.

Educational leadership extends beyond authority and administrative control, it is fundamentally rooted in vision building, participatory decision-making and capacity development. Administrators must inspire trust, encourage teamwork and cultivate a sense of ownership among teachers and staff. Such collaboration leadership enhances institutional resilience and ensures smooth implementation of academic and administrative reforms.

Governance framework in education also demands transparency and accountability. Clear policies, well-defined roles and systematic evaluation mechanisms strengthen institutional functioning. When governance is inclusive and responsive, it creates an environment where innovation thrives and challenges are addressed constructively.

Capacity building and professional empowerment represent a significant dimension of leadership and governance. Educational administrators are accountable for nurturing leadership at multiple levels by supporting continuous professional development, guide emerging leaders and encouraging reflective practices. Empowering instructors or educators with sovereignty and opportunities for prosperity enables institution to adopt more effectively to change and ensure continuity in leadership and administration.

The role of ethical leadership and value-based governance is equally important. Administrators must uphold principles of equity, integrity and inclusiveness while making decisions that affect diverse stakeholders. Ethical governance not only ensures adherence to regulatory frameworks but also fosters a culture of trust, fairness and social responsibility. By integrating leadership values with effective governance practices, administrators can steer institutions towards long-term excellence and social relevance.

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# **Content Analysis: Social Entrepreneurship's Competencies in the Ninth-Grade Science Textbook of NCERT**

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## **Abstract**

India is poised to become a major global economy, and there is a pressing need to address employment challenges and foster innovative solutions. Social entrepreneurship is gradually recognized as a pivotal approach to addressing the increasing unemployment issue among Indian youth by combining entrepreneurial skills – problem solving, innovation, and community engagement with the Indian education system. Embedding social entrepreneurship in school education fosters responsibility, innovation, and problem-solving at an early stage, preparing learners to address local and global challenges. Such integration not only empowers students with practical skills but also contributes to building inclusive communities and promoting sustainable practices. In the long run, these competencies enhance national development by nurturing a generation of youth equipped to drive social change and economic growth simultaneously. The National Education Policy 2020 and National Curriculum Framework 2023 also highlight the need for education to promote entrepreneurial and practical skills in students. The study aims to evaluate the extent to which the science textbook facilitates the cultivation of social entrepreneurship skills, specifically examining its effectiveness in motivating students to engage with and utilise these abilities, through analysing the content of the ninth-grade textbook published by the National Council of Educational Research and Training (NCERT), New Delhi. Certainly, students should have specific skills to become social entrepreneurs. The research findings on examining the textbooks, critical thinking, activity and discussion, and problem-solving skills are more distributed than creativity and collaboration. Moreover, the study concluded that the textbook is sufficient for cultivating social entrepreneurship abilities among secondary school students.

**Keywords:** Social Entrepreneurship, Science, NEP 2020, NCF 2023, NCERT

## **Introduction**

In recent years, the concept of social entrepreneurship has gained significant attention (Dobele, 2016). It is regarded as a powerful means to address societal challenges through innovative and sustainable solutions (Moulaert et. al., 2013), because the social entrepreneurs focus on creating social value rather than generating profit (Dees, 1998). The present moment is unprecedentedly critical for entrepreneurship, with a primary challenge

for all economies being the cultivation of a more entrepreneurial culture and the enhancement of requisite skills, attitudes, and behaviours to equip young entrepreneurs. As the world grapples with pressing issues such as inequality, climate change, social change, and developmental problems. So, there is also a growing need to equip the next generation with the skills, knowledge, and modern mindset necessary to develop effective social entrepreneurs (Kirby & Ibrahim, 2011). Education, particularly at the secondary school level, plays a crucial role in this endeavor by embedding the essential skills for social entrepreneurship into various subjects, including those traditionally seen as unrelated to social issues, such as science (Deb & Panda, 2021).

Science, as a discipline, provides students with a deeper understanding of nature and makes them critical thinkers, problem-solvers, and analytical thinkers (Bybee, 2010; Akerson et al., 2018; Anitha & Bharathi, 2023). However, the potential of science education in terms of contributing to social entrepreneurship is often overlooked. By integrating social entrepreneurship concepts into science education, students can be encouraged to apply their scientific knowledge to develop innovative solutions to social and environmental problems (Gerli et. al., 2020). This approach not only broadens the scope of science education but also aligns with the broader educational goals of fostering social responsibility, critical thinking, and creative citizens (Beane, 1997).

This study seeks and enlists essential skills required for social entrepreneurs and points out the extent to which the skills are reflected and how it is contextualized within the textbook of science. Whereas Previous studies had emphasized the importance of embedding social entrepreneurship in educational curricula to prepare students for active roles in addressing global challenges (Kickul & Lyons, 2020), addressing complexities of modern society and to foster a sense of ethical responsibility (Hockerts, 2018). Thereby contributing to the ongoing discourse on the seeding of social entrepreneurship among students in secondary education (Kickul et al., 2022).

## **Entrepreneurship and Social Entrepreneurship**

Entrepreneurship Education (EE) generally aims to enhance awareness, motivation, and knowledge essentials for effectively pursuing and managing entrepreneurial ventures (Khoury et al., 2012; Fayolle, 2018; and O'Connor, 2013). such as idea generation, opportunity identification, securing funds, reinvesting profits, efficient resource management, and understanding business models and market strategies for sustainable ventures.

It is widely acknowledged that social entrepreneurs are a unique group motivated by social principles. (Chell, 2007). Social entrepreneurs are often seen as change agents with strong collaborative leadership and networking abilities. Moreover, people in these positions have special business abilities along with a practical social mission and a strong work ethic. (Satar & Natasha, 2019; Weerawardena & Mort, 2006). Indeed, social passion has emerged as a distinct aspect of the entrepreneurial orientation of social entrepreneurs (Satar & Natasha, 2019).

Although the characteristics of commercial entrepreneurship orientation—innovativeness, proactiveness, and risk-taking—are equally relevant in the social entrepreneurship context

(Kraus et al., 2017). Therefore, social entrepreneurs must acquire business planning skills similar to those of conventional entrepreneurs to evaluate, identify, and utilise opportunities to create social value through commercial and market-based activities (Phillips et al.2015). These planning skills can provide a range of benefits for social entrepreneurs (Kummitha, 2016).

## **Education for Entrepreneurship**

Across the globe, there has been a growing emphasis on social entrepreneurship education, with business schools and academic institutions offering short-term courses, electives, undergraduate and postgraduate programs and open online courses (Hockerts, 2018). Furthermore, social entrepreneurship is taught at prestigious universities, including the Tata Institute of Social Sciences, Harvard Business School, Stanford, Cambridge, Oxford, and the University of Singapore. To support teaching, learning, mentoring, and research pertaining to social entrepreneurship and community development, specialised Social Entrepreneurship Centres have also been established worldwide, such as the Asia Centre for Social Entrepreneurship and Philanthropy (ACSEP), ASHOKA Foundation, and Skill Centre for Social Entrepreneurship (Shahid & Alarifi, 2021). Thereafter, in India, social entrepreneurship skills are largely driven by the government, as the National Policy on Skill Development and Entrepreneurship was established in 2015, the result of which was the launch of the Skills India Mission (Kaushal Bharat Kosal Bharat) in 2015 to develop different skills by 2022. Simultaneously, the Ministry of Skill Development and Entrepreneurship started numerous training programmes and institutions to facilitate entrepreneurship generation. The National Education Policy 2020 emphasised the skills needed to develop job creators rather than job seekers. For social enterprises, initiatives like Startup India and Stand-Up India offer funding, incubation, and mentorship. The Atal Innovation Mission also encourages entrepreneurship and innovation with an emphasis on social impact.

There is a need to align educational practices with these concepts at the school level. National Education Policy (NEP) 2020 also underscores its importance implicitly and promotes the need for teaching methods, curricula, and classroom environments that cultivate the skills and competencies essential for social entrepreneurship. Brock and Steiner (2009) analysed 107 social entrepreneurship syllabi from 72 colleges and universities across the U.S., Asia, and Europe and found that social entrepreneurship courses focused on addressing social needs and problems, innovation, scaling social ventures, resource acquisition, opportunity recognition, developing sustainable business models, and measuring outcomes.

However, to become a social entrepreneur, students need to be competent in entrepreneurship skills. So, after secondary education, students from the science stream could make choices to become entrepreneurs. Therefore, being aware of social entrepreneurship helps students to know about their potential in entrepreneurship and assists them in becoming job providers rather than job seekers

## Review of Related Literature

NEP 2020 does not explicitly mention social entrepreneurship. Meanwhile, it emphasizes aspects of education that align with its principles, such as community involvement, volunteerism, holistic development, creativity, critical thinking, inclusive education, and equity. Similarly, the NCF 2023 proposed to integrate vocational education into the curriculum to foster essential skills like problem-solving, critical thinking, and practical experience—skills crucial for social enterprises. Critical thinking is crucial for problem-solving, while collaboration skills enable effective teamwork (Bacq & Janssen, 2011). These competencies help learners create social ventures that address societal needs (Choi & Majumdar, 2014). Whereas Bornstein and Davis (2010) discussed that competencies contain creativity to generate new ideas, leadership to guide and inspire teams, and financial acumen to ensure sustainability. Learners must also be empathetic to understand the needs of communities and use ethical reasoning to make decisions that align with social values. Additionally, NCF highlights social sciences education as a critical area for developing an understanding of society and human behaviour, which can be important to becoming social entrepreneurs who aim to create culturally and contextually relevant solutions.

Thus, students learn about social entrepreneurship concepts and acquire the skills, abilities, and attitudes necessary for effective social participation (Kirby & Ibrahim, 2011). Fayolle (2018) further emphasizes integrating softer entrepreneurial topics into educational practices, such as developing an entrepreneurial mindset, opportunity construction, work-life balance, managing emotions, and learning from failure. Although these "softer" entrepreneurial topics are important, Brock and Steiner (2009) provide a detailed conceptual framework highlighting the seven most common elements of social entrepreneurship that should ideally be included in every curriculum. These elements are:

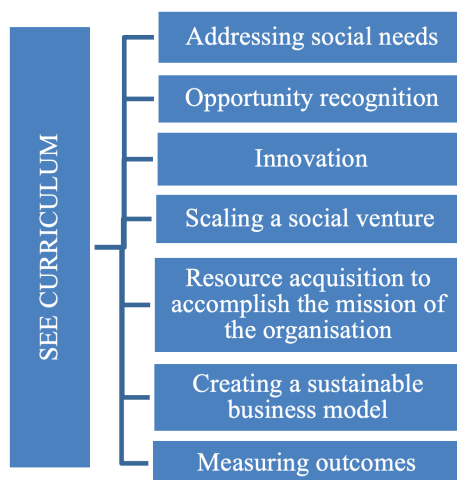


Figure 2.1: Elements for SEE Curriculum

Thus, the elements in the curriculum develop social entrepreneurial skills among the students. delimited social entrepreneurial skills from entrepreneurial skills (Martin & Iucu, 2014)

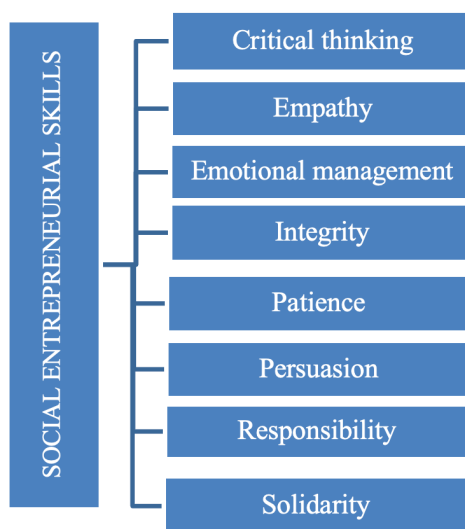


*Figure 2.2: Social Entrepreneurial Skills*

Innovation is the creation of new ideas that improve efficiency. Creativity fosters the generation of novel ideas, which is essential for innovation (Shoop & Ressler, 2011). Critical thinking allows for the analysis and refinement of these ideas. (Sari & Wardhani, 2020). Collaboration brings diverse perspectives together, enhancing the creative process and thus leading to more effective innovations (Baruah & Paulus, 2018). Leadership is the action of leading the group to achieve organisational goals. Collaboration fosters teamwork and communication, which is essential for leading diverse groups (Johnson & Johnson, 2013). Critical thinking enhances decision-making and problem-solving, allowing leaders to navigate complex challenges (Facione, 2011). Creativity drives innovation and adaptability, which is crucial for visionary leadership (Sawyer, 2017). Thus, collaboration, critical thinking, and creativity are pivotal in developing leadership skills among students. Teamwork and cooperation encourage each student to take ownership of their roles, enhancing both personal and collective sense of responsibility within students (Eliasa, 2014). Through science education, students apply critical thinking and problem-solving skills to understand and address the root cause of social problems such as climate change and public health (Shagdarjav, 1993; Rodriguez & Morrison, 2019). Engaging students in inquiry-based learning, hands-on experiments, practical problem-solving tasks, and critical thinking activities enhances their ability to recognize opportunity (Garris et al., 2017; Dickman et al., 2009). Ethical practices cultivate integrity (Webber, 2022), and problem-solving skills develop students' patience (Suryanti, & Supeni, 2019). Discussions and presentations enhance persuasion (Balakrishnan & Paramasivam, 2023), and handling activities and setbacks of experiments develops emotional management skills. Collaborative tasks promote empathy (Gyles, 2024), and teamwork strengthens solidarity among the students (Nainggolan et al., 2024). Hence, the present study consolidates all the required competencies for social entrepreneurship and formulates the charts that present the skills in Figure 3 that may be necessary for secondary school students to become social entrepreneurs in the future.

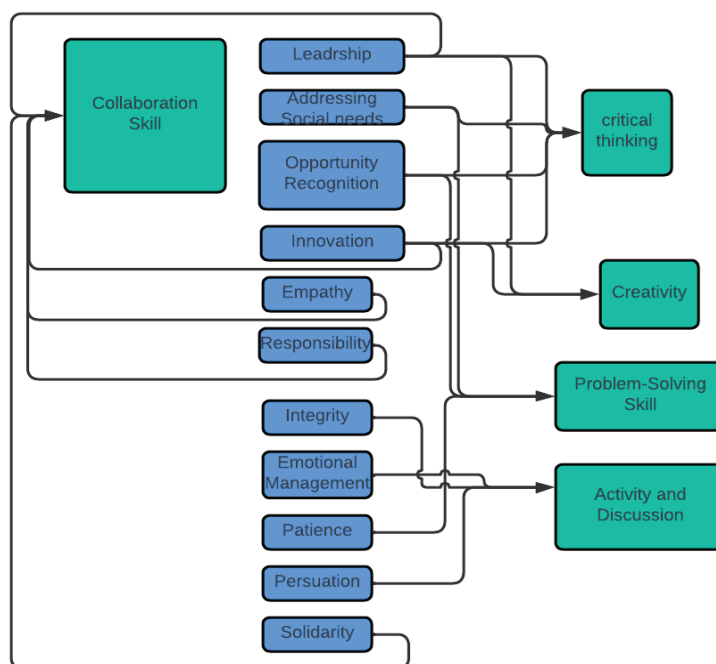


Figure 2.3: SE Skills at the School Level

## Role of Textbooks in Cultivating Skills

The effectiveness of textbooks is evaluated based on how well they align with the curriculum and established learning objectives (Morgil & Yilmaz, 1999). Kul et al. (2018) emphasized that teachers often rely on textbooks as a primary tool to achieve these objectives in their teaching. Textbooks are designed to incorporate learning experiences that equip students with the knowledge and skills outlined in the curriculum. Therefore, it becomes essential to identify the extent to which the NCERT-published textbook specifies social entrepreneurship skills, as it serves as a guide for achieving the intended competencies. Aybek et al. (2014) highlighted that the quality of education students receive is largely influenced by the textbooks schools adopt. Hence, assessing textbooks for the integration of social entrepreneurship skills is crucial. In this context, the present study seeks to examine how extensively these skills are embedded within the texts.

Therefore, the outcomes of this study will offer meaningful insights for educators, curriculum planners, and policymakers seeking to strengthen the relevance and effectiveness of science education in promoting social entrepreneurship skills at the secondary level. In addition, the research will highlight the role of science content, illustrating how science subjects can significantly contribute to nurturing the competencies and abilities essential for social entrepreneurship (Mair & Noboa, 2006; Bux & Van Vuuren, 2019; Ribeiro et al., 2023). Hence, the research question for this study is: Where do social entrepreneurship skills reflect in science textbooks?

## **Objective of the Study**

The overall objective of the study lies in analyzing activities and exercises written in the science textbook of the ninth-grade, which is published by NCERT, Delhi, for secondary school students regarding the development of social entrepreneurship skills. To reach this goal, a specific objective was defined:

- To analyze the activities, exercises, and questions in a chapter that usually promote social entrepreneurship skills at the secondary school level.

## **Methodology**

### **Design**

This study adopted a qualitative research approach to gain a deeper understanding of the social entrepreneurship competencies presented in the ninth-grade science textbook. Qualitative research is focused on exploring and interpreting the meanings and experiences within a specific context, using non-numeric data such as texts (Creswell, 2014). In this case, a qualitative content analysis was employed to examine how the textbook contains social entrepreneurship skills. This method involves systematically analysing textual data to identify patterns, themes, and meanings that reflect the competencies necessary for fostering social entrepreneurship among secondary school students.

### **Data Source**

The ninth-grade level was selected for this study as it represents a pivotal stage in secondary education. Since the focus was on analysing an instructional resource employed by teachers to teach science in the classroom, the data were drawn from the textbook titled “SCIENCE Textbook for Class IX”. This science textbook was selected through a purposive sampling technique. There are 12 chapters with activities, questions, and exercises in them. The rationale for selecting this textbook is that public and private secondary schools in India use it widely, and the NCERT, Delhi, published it.

### **Unit of Analysis**

The unit of analysis in this study comprised each individual activity and question presented in the textbook, categorized as any of the following:

- Wh- questions
- How questions
- Multiple-choice questions
- Discussion questions
- Group activities
- Statement-type questions

### **Procedure**

In order to analyse the social entrepreneurship skills contained in the textbook. The textbook was first skimmed for its general presentation of content. Then, the researchers reviewed all the activities, questions, and exercises presented in the textbook and the codes to collect

data. content analysed only text-based exercises. For this, NVivo software (free trial version) was used to organise and analyse the data. Social entrepreneurship skills were analysed using the researcher's proposed structure. The researcher codified activity, question and exercise, calculated the percentage of each skill in the chapter, and then interpreted the results. The proposed structure organizes social entrepreneurship skills at the school level into five categories: Problem-solving skills, Collaboration, Creativity, Critical thinking, and Activity and Discussion.

| Topics                         | Code                    | Explanation                                                                                                                  |
|--------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Social Entrepreneurship Skills | Problem-solving skills  | Problem-solving skills refer to the ability to select a particular formula and give values.                                  |
| Social Entrepreneurship Skills | Collaboration           | Collaboration refers to those activities, exercises, and questions that are asked to solve a problem in a group.             |
| Social Entrepreneurship Skills | Creativity              | Creativity involves all those activities, exercises, and questions which ask to organize, classify, reason, label, and draw. |
| Social Entrepreneurship Skills | Critical thinking       | It involves all those activities, exercises, and questions that start from why, what, and how.                               |
| Social Entrepreneurship Skills | Activity and Discussion | It refers to performing real-life experiments, group activities, and discussions on the concept.                             |

## Result

This section presents the findings derived from the analysis of activities, questions, and exercises in the Science Textbook, which enabled the researcher to address the research question.

### 4.1 Critical Thinking

The operational verbs used in activities, exercises, and questions in this textbook are where, what, in which, give a reason, explain, how, classify, identify, and compare. Some samples involved in this category are, for instance, the students have to answer the following questions:

1. "Take some water in a container, try cutting the surface of water with your fingers. • Were you able to cut the surface of water? What could be the reason behind the surface of water remaining together?" (NCERT, 2021, p.3).
2. "Suppose you and your friend are on the moon. Will you be able to hear any sound produced by your friend?" (NCERT, 2021, p.163).
3. "How are the wavelength and frequency of a sound wave related to its speed?" (NCERT, 2021, p.132).
4. "What can you say about the motion of an object whose distance-time graph is a straight-line parallel to the time axis?" (NCERT, 2021, p.107).

5. “Place a water-filled tumbler on a tray. • Hold the tray and turn around as fast as you can. We observe that the water spills. Why?” (NCERT, 2021, p.91).

Figure 4 indicates that all the chapters promote critical thinking. This finding implies that a sufficient number of questions, activities, and exercises are available in this textbook, with percentages ranging between 0.9% and 5 %. Chapters 1, 2, 8, 9, and 10 have percentages ranging between 2.5% and 5%, whereas Chapter 8 has the maximum activities, questions, and exercises that promote critical thinking. Chapters 3, 4, 5, 7, 11, and 12 have percentages ranging between 0.9% and 2.5%, whereas Chapter 6 has minimal activities, questions, and exercises that promote critical thinking. 91).

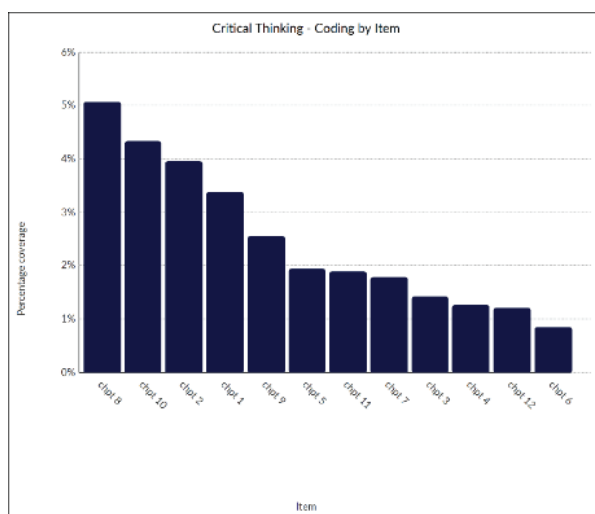


Figure 2.4: Critical thinking

## 4.2. Creativity

The operational verbs used in activities, exercises, and questions in this textbook are try, observe, repeat, analyze, make a list, identify, inferences, justify, illustrate, make a list, draw, and explain. Some samples involved in this category are, for instance, the students have to answer the following questions:

1. “What is the work done by the force of gravity on a satellite moving around the Earth? Justify your answer.” (NCERT, 2021, p.125).
2. “Make a list of different types of musical instruments and discuss with your friends which part of the instrument vibrates to produce sound.” (NCERT, 2021, p.128).
3. “Give two practical applications of the reflection of sound waves.” (NCERT, 2021, p.138).
4. “Comb dry hair. Does the comb then attract small pieces of paper? Rub a glass rod with a silk cloth and bring the rod near an inflated balloon. Observe what happens.” (NCERT, 2021, p.38).
5. “Diagrammatically show the difference between the three types of muscle fibres.” (NCERT, 2021, p.70).

Figure 5 indicates that all the chapters promote creativity. This finding implies that a good number of questions, activities, and exercises are available in this textbook, with percentages ranging between 0.4% and 6.2%. Chapters 5, 7, 9, and 10 have percentages ranging between 3.2% and 6.2%, whereas Chapter 10 has the maximum activities, questions, and exercises that require creativity. Chapters 1, 2, 3, 4, 6, 8, 11, and 12 with percentages ranging between 0.4% and 2.2%, whereas Chapter 1 has the minimum activities, questions, and exercises that encourage creativity among the students.

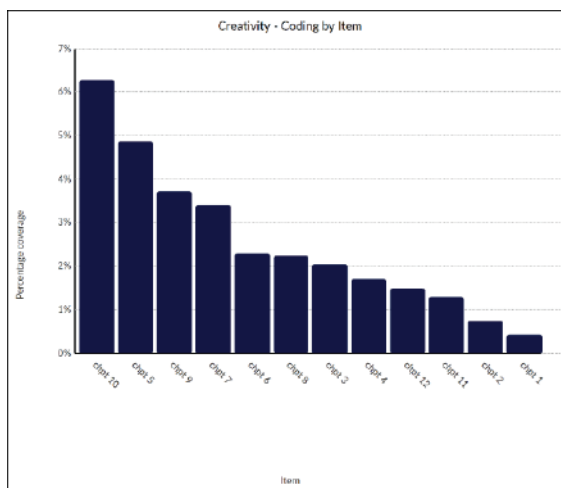


*Figure 2.5: Creativity*

### 4.3. Collaboration

The operational verbs used in activities, exercises, and questions in this textbook are play, prepare, discuss, and observe. Some samples involved in this category are, for instance, the students have to answer the following activities:

1. “Play this game in the field— make four groups and form human chains as suggested:...” (NCERT, 2021, p.3).
2. “Prepare a model to demonstrate the movement of particles in solids, liquids and gases.” (NCERT, 2021, p.13).
3. “A few sources of energy are listed above. There are many other sources of energy. List them. Discuss in small groups how certain sources of energy are due to the Sun.” (NCERT, 2021, p.116).
4. “Observe what happens and discuss with your friends.” (NCERT, 2021, p.127).

Figure 6 indicates that chapters 1, 2, 3, 9, 10, and 11 have questions, activities, and exercises that ensure student collaboration. This finding implies that few questions, activities, and exercises are available in this textbook, with percentages ranging between 0.2% and 3.6%. Chapters 1, 2, 3, and 11 have percentages ranging between 0.2% and 1.5%, whereas Chapter 2 has minimum activities, questions, and exercises, and with a percentage of 3.6%, Chapter 10 only has maximum activities, questions, and exercises that ensure collaboration.

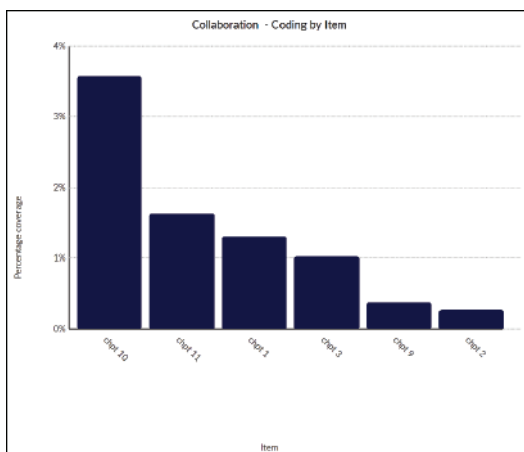


Figure 2.6: Collaboration

#### 4.4. Activity and Discussion

The operational verbs used in activities, exercises, and questions in this textbook are put, take, drop, play, collect, start, prepare, and think of. Some samples involved in this category are, for instance, the students have to answer the following activities:

1. “Take a close look at the electric meter installed in your house. Observe its features closely. Take the readings of the meter each day at 6.30 am and 6.30 pm. Do this activity for about a week. How many ‘units’ are consumed during the daytime? How many ‘units’ are used during the night? Tabulate your observations. Draw inferences from the data. Compare your observations with the details given in the monthly electricity bill (One can also estimate the electricity to be consumed by specific appliances by tabulating their known wattages and hours of operation).” (NCERT, 2021, p.123).

2. “Visit a livestock farm. Note the following: (1) Number of cattle and number of different breeds. (2) The amount of daily milk production from the different breeds.” (NCERT, 2021, p.147).

3. “Make placards with symbols and valencies of the elements separately. Each student should hold two placards, one with the symbol in the right hand and the other with the valency in the left hand. Keeping the symbols in place, students should criss-cross their valencies to form the formula of a compound.” (NCERT, 2021, p.36).

4. “Drop a crystal of copper sulphate or potassium permanganate into a glass of hot water and another containing cold water. Do not stir the solution. Allow the crystals to settle at the bottom. What do you observe just above the solid crystal in the glass? What happens as time passes? What does this suggest about the particles of solid and liquid? Does the rate of mixing change with temperature? Why and how?” (NCERT, 2021, p.2).

5. “Take a 100 mL beaker. • Fill half the beaker with water and mark the level of water. Dissolve some salt/ sugar with the help of a glass rod. Observe any change in water level. What do you think has happened to the salt? Where does it disappear? Does the level of water change?” (NCERT, 2021, p.1).

Figure 7 indicates that all chapters have questions, activities, and exercises that provide scope for activity and discussion among the students, except for Chapter 8. This finding implies that many questions, activities, and exercises are available in this textbook, with percentages ranging between 0.1% and 8.9%. Chapters 1 have maximum activities for discussion and experiments with a percentage of 8.9%, whereas Chapter 4 has a minimum with a percentage of 0.1%.

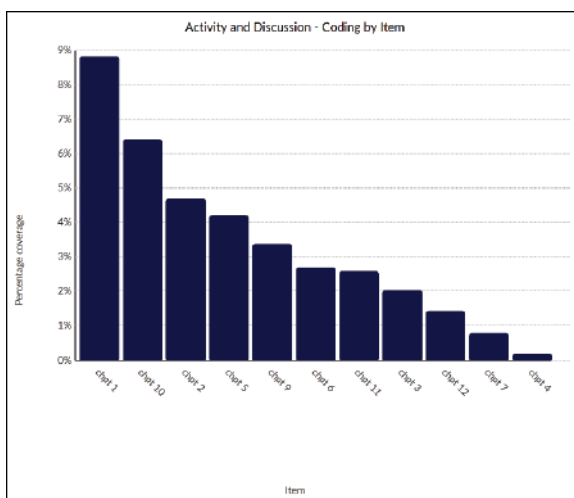


*Figure 2.7: Activity and Discussion*

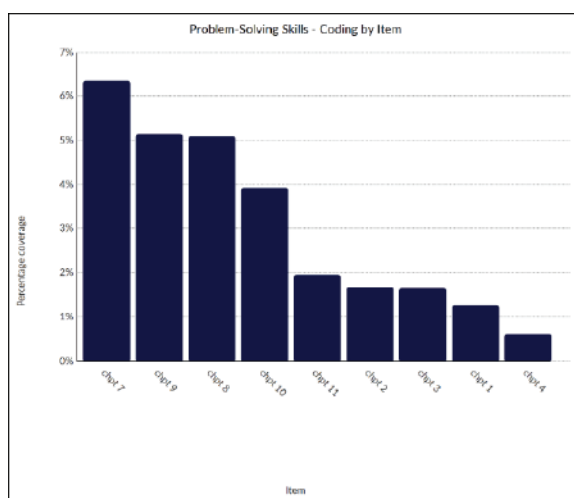


*Figure 2.8: Problem-Solving Skills*

## 4.6. Distribution of social entrepreneurship skills throughout the science textbook

Figure 9 categories different social entrepreneurship skills according to their relative coverage. This visualization represents how different skills are distributed within the curriculum of science textbooks. This shows that critical thinking occupies the largest space, followed by problem-solving skills, the second largest skill. Whereas collaboration is represented by a smaller segment, suggesting it is the least emphasized among the skills listed. Hence, the prominence of critical thinking and problem-solving skills suggests a strong focus on developing cognitive abilities in learners.

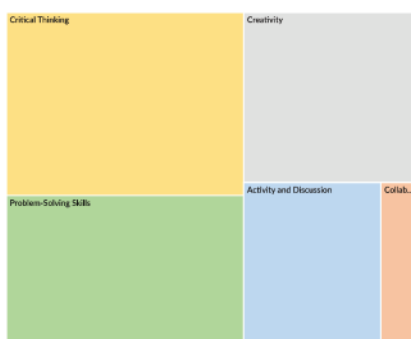


Figure 2.9: Distribution of skills

## 4.7. Analysis of unit of analysis (items) through word similarity

Figure 10 is a dendrogram in which the clusters are formed based on word similarity among different skills. This shows that Collaboration Skills and Activity and Discussion are grouped closely together, indicating a high degree of similarity in terms of word usage or concept. Creativity is somewhat related to the first group but stands as a distinct cluster, showing moderate similarity to "Collaboration Skills" and "Activity and Discussion". Critical Thinking and Problem-Solving Skills are closely related, forming a distinct cluster separate from the others. This suggests that these two skills are often conceptualized together. Hence, the dendrogram suggests that "Collaboration Skills" and "Activity and Discussion" are more similar to each other than to "Critical Thinking" and "Problem-Solving Skills," which form another closely related pair. "Creativity" falls in between but is slightly more related to the first pair.

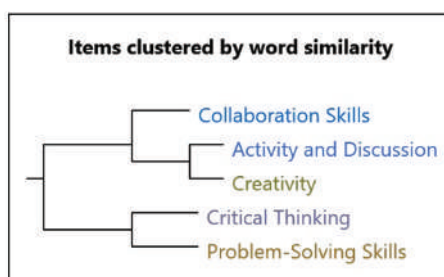


Figure 2.10: Items clustered by word similarity

## **Conclusion**

The analysis of the ninth-grade Science Textbook reveals a diverse emphasis on various educational skills across chapters, with notable variations in the focus on critical thinking, creativity, collaboration, activity and discussion, and problem-solving skills.

Critical thinking is strongly emphasized throughout the textbook. Operational verbs like "explain," "compare," and "classify" are frequently used in activities and questions, which aligns with educational objectives that prioritize cognitive development and analytical reasoning. The data shows that critical thinking is prevalent in chapters 1, 2, 8, 9, and 10, with Chapter 8 featuring the highest percentage of activities promoting this skill. This focus supports the notion that critical thinking is essential for understanding complex scientific concepts and solving related problems.

Creativity is also encouraged, but to a lesser extent. Activities involving verbs such as "draw," "illustrate," and "make a list" are spread across the chapters, with Chapters 5, 7, 9, and 10 showing the highest percentages of creative tasks. However, Chapter 1 stands out with the lowest percentage of creative activities. The presence of creative tasks, though less emphasized, is crucial for fostering innovative thinking and problem-solving capabilities.

Collaboration is the least emphasized skill, with operational verbs like "discuss" and "observe" used sparsely. Chapters 1, 2, 3, 9, 10, and 11 contain collaborative activities, but the overall percentage remains low, indicating a potential area for improvement. The textbook's focus on collaboration appears less integrated compared to other skills, suggesting a need for more structured group activities to enhance cooperative learning (Johnson et al., 1998).

The analysis of activity and discussion highlights a broad inclusion of practical exercises, except in Chapter 8. Chapters 1, 4, and 7 exhibit the highest engagement in activities, promoting hands-on learning and discussions that are integral for applied understanding. Problem-solving skills are well represented, with tasks involving calculations and theoretical questions. Chapters 7, 8, 9, and 10 lead in fostering these skills, whereas Chapters 5, 6, and 12 are less focused on problem-solving activities.

The dendrogram analysis indicates that critical thinking and problem-solving skills are closely related, suggesting that these cognitive processes often overlap in educational settings. Conversely, collaboration and activity-based discussion form a separate cluster, highlighting their distinct roles. Creativity, while related, stands somewhat apart but shares moderate connections with collaborative and discussion-based tasks.

In conclusion, the ninth-grade Science Textbook demonstrates a strong emphasis on critical thinking and problem-solving skills, with varied attention to creativity and collaboration. Hence, the textbook develops social entrepreneurship skills among the students; further integrating more collaborative and creative activities could provide a more balanced development of social entrepreneurship skills, preparing students to become great social entrepreneurs.

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# **National Professional Standards for Teachers (NPST): A Framework for Advancing Teacher Professionalism and Educational Quality in India**

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## **Abstract**

Teacher professionalism is the foundation of an effective education system. Teachers influence the intellectual, social, and moral development of learners. In the Indian context, the essential to redefine and reinforce teacher professionalism has been done through the introduction of the National Professional Standards for Teachers (NPST) under the National Education Policy (NEP) 2020. The NPST framework represents comprehensive benchmarks for teacher competence encompassing disciplinary knowledge, pedagogical expertise, ethical practice, inclusivity, and sustained professional growth. NPST through standards, seeks to enhance teacher accountability, foster professional integrity, and ensure coherence and equity in the quality of education nationwide. It seeks to prepare qualified and quality teachers. Despite persistent challenges NPST has the tendency to remove disparities in teacher education quality, infrastructural inadequacies, and limitations in monitoring and evaluation mechanism. NPST has the transformative potential to elevate teaching to the level of other highly regarded professions such as law and medicine. Through the alignment of teacher competencies with the broader educational goals of equity, excellence, and national development, the NPST emerges as a pivotal instrument for advancing the quality and professionalism of education in India. The present paper critically examines the opportunities afforded by the NPST in promoting quality education and explores the existing challenges impeding its effective realization.

**Keywords:** Teacher Education, Quality Teaching, Professional Standards, National Education Policy 2020

## **Introduction**

Teachers are the nation builders. They play the noblest and most respected role in the society. Teachers are the source of transfer of knowledge, skills and ethics to the society. According to NEP (2020), 'The most important factor in the success of educational system is the quality and engagement of its faculty' (NEP 2020 pp.40). In any country quality education mainly depends on the competence, commitment and professionalism of its teachers. In Indian context, teachers are expected to grounded in Indian values, languages, knowledge and traditions as well as latest developments in education and pedagogy (NEP 2020 pp. 42). Teacher's professionalism strengthens the system through creation of quality

teachers. Teacher's professionalism includes teacher's knowledge, skills, ethics, reflective practice and facilitation of effective learning experiences. Teacher's professionalism is enhanced through the abidance of professional standards. Para 5.20 of NEP 2020 emphasises upon the creation of national professional standards for teachers (NPST) to enhance quality in educational system. The main purpose was to uncover the expectations and competencies from the teachers at different levels. In India we have pluralistic and decentralized educational landscape, for which establishing a common professional was very difficult and challenging but with the arrival of New Education Policy 2020, professional standards for teachers came into being. These standards were framed by NCTE in the year 2021 and named National Professional Standards for Teachers (NPST). NPST came in the form of a guided document in 2023. NPST provides a clear framework for defining teacher quality and professionalism. It outlines expected competencies in knowledge, skills, values, and ethics. These professional standards will be a carrier of continuous professional development and lifelong learning of teachers. NPST is remarkable in terms of ensuring accountability and consistency in teaching practices across contexts. It aims to enhance the quality of education and student learning outcomes throughout the nation.

In the present article authors tried to explore the role of NPST in promoting teacher professionalism and thereby strengthening quality education in India. The analysis is organized in the following sequence: first, a conceptual overview of teacher professionalism; second, an outline of NPST—its objectives, structure, and intended users; third, a discussion of mechanisms through which NPST promotes professionalism (identity, practice, development, and accountability); fourth, an examination of implementation challenges; and finally, strategic recommendations for maximizing NPST's positive impact.

## **Conceptualizing Teacher Professionalism**

The etymology of the terms “Profession” and “Professor” can be traced to the Latin word *profess*, which denotes a public declaration of expertise within a specific domain of knowledge or skill (Baggini, 2005). Hoyle (1975) conceptualized professionalism as “the set of strategies and rhetorical practices employed by occupational groups to advance their status, remuneration, and working conditions (as cited in Evans, 2007)”. In a subsequent refinement of this perspective, Hoyle (2001) shifted the focus from status enhancement to the improvement of service quality, thereby framing professionalism as a commitment to elevating practice standards rather than primarily securing professional privilege. Teacher professionalism is also multi-dimensional. Key dimensions found in literature include: 1) knowledge and pedagogy i.e mastery of subject matter as well as understanding to effectively teach across different backgrounds and abilities. 2) ethics and commitment i.e adherence to ethical standards. 3) Reflective Practice i.e Continuous reflection on one's practice. 4) Autonomy and Judgment i.e Professional judgment exercised in varied classroom and systemic contexts. 5) Collaboration and Leadership i.e Engagement in collegial learning communities and mentoring. 6) Accountability and Standards i.e Willingness to be assessed against professional standards and to use standards to guide development (Demirkes imonglu, 2011; Carr, 1992; Gilmeeva, 1999).

Professionalism contrasts with mere occupational or mechanical performance; it implies a

public, ethical commitment to standards of practice and to continual improvement. The professionalism is visible in a teacher in the form of lesson planning anchored in the learning outcomes, inclusive classroom strategies, formative assessment practices, and engagement with parents and communities.

## **Teacher Standards Around The Globe**

Since the beginning of the new millennium, countries across the world have increasingly focused on developing professional standards for teachers (Allard, Mayer, & Moss, 2014; Caena, 2014; Ingvarson, 2012). In the United States, the National Board for Professional Teaching Standards (NBPTS) was established to enhance the quality of teacher education. Research by Ingvarson and Hattie (2008) revealed that NBPTS has significantly contributed to improving both teacher effectiveness and student learning outcomes. According to Desimone and Garet (2015), effective professional practices in the U.S. are built on five core principles: content focus, active learning, coherence, sustained duration, and collective participation. Similarly, in Japan, teacher professionalism is fostered through both formal and informal professional development initiatives, emphasizing continuous learning (Collinson & Ono, 2001). In England, these reforms have evolved into what Whitty (2014) describes as a framework for “national professionalism.”

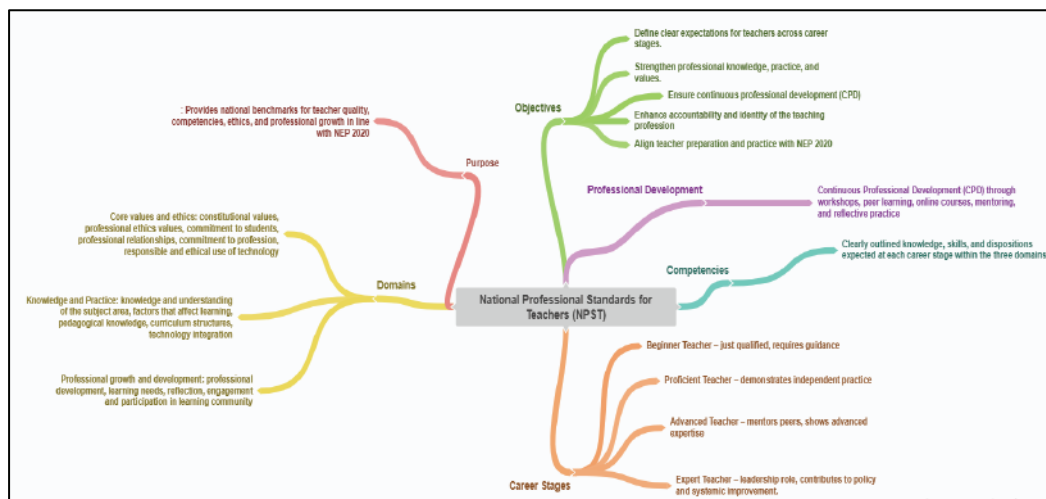
In Australia, the established professional standards provide support to pre-service as well as in-service teachers. They act as a method to enhance organizational learning. Despite being promising, the framework has frequently faced criticism for being excessively technical and pragmatic (Lambert & Gray, 2020). In the last ten years, Australia has created and implemented major reforms, in alignment with contemporary knowledge and teacher expectations. Considering the cultural and contextual diversity, these standards are organized into four developmental stages (Santoro, 2013). In developing countries like Pakistan, national professional standards were established in 2009 with assistance from USAID and the Ministry of Education. However, a study by Mahmood, Hina, and Arshad (2020) found that pre-service teachers’ awareness of these standards remains limited. The study also identified gaps in professional development opportunities and a lack of effective policy evaluation mechanisms. Different countries have different perspectives towards the standards which can become clearer through the following table:

| <b>Country</b> | <b>Competencies and focus areas in professional standards</b>                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| India          | Focus on values, ethics, knowledge, pedagogy and professional development                                                                                                     |
| United states  | Core competencies include content knowledge, instructional practice and professional responsibility                                                                           |
| Japan          | Focused on instructional skills, student support system and professional development                                                                                          |
| United Kingdom | System is divided between four provinces but the overall core competencies include high ethical standards, classroom management, team work, lifelong learning and innovation. |
| Australia      | Focus on Student Engagement, Assessment, Diverse Learners, Collaboration, Reflective Practice                                                                                 |

## Overview of NPST: Objectives and Structure

The National Professional Standards for Teachers (NPST) offers a comprehensive and detailed framework which includes all the major competencies required from a quality teacher. It has proved to be an important tool to reinforce accountability within the education system. These standards guarantee teacher quality and professional growth. The clear stated expectations will improve teaching methodologies and students learning on a wider level.

## NPST Framework at a Glance



Source: <https://ncte.gov.in/website/PDF/NPST/NPST-Book.pdf>

## How NPST Supports Teacher Professionalism and Quality Education

NPST supports teacher professionalism as it articulates the teacher towards a professional identity (Kumar, 2023). It provides a clear set of standards to help teachers look at themselves as a part of a recognized profession. NPST enhances the professional competencies of teachers. The career stages mentioned in the document very clearly portray the role of teacher at each stage. When teachers identify themselves as professionals and will work towards recognized standards, the aims of quality teaching will be easily achieved. NPST will also help to guide pre-service teachers by creating a focus of newly qualified teachers on what is expected from them in the profession (Patil & Karad, 2022). If teacher education institutions' curricula are aligned with NPST competencies, the entrants will possess essential pedagogical skills, familiarity with inclusive practices and basic assessment literacy. NPST also provides benchmarks against which mentoring and early-career support can be structured. Structured induction informed by NPST reduces the gap between theory and practice and accelerates professional maturation. NPST structures continuous professional development of teachers as strategic and outcome-focused (Misra, 2021). Now, Teachers' development plans can be mapped to specific NPST competencies,

ensuring targeted improvement. There will be recognized incremental gains to teachers through short courses and certifications. NPST will offer a common framework for peer observation, lesson study, and collaborative inquiry. NPST will also improve the pedagogical practice and assessment through teachers. NPST emphasizes learner-centred pedagogy, differentiated instruction, inclusive strategies and teaching of diverse learners through appropriate integration of technology in teaching. Inclusion of these will definitely promote student engagement, learning outcomes and classroom equity (Mohalik, et.al.(2024)).

NPST also promotes professional accountability and career progression of teachers. It creates a meritocratic environment for promotions through a transparent appraisal system. Promotions will be based on demonstrated competencies rather than seniority. Finally, NPST facilitates policy coherence and systematic reform. NPST provides policymakers with a coherent set of expectations that can guide reforms in curriculum, assessment policy, teacher recruitment, and resource allocation. For decentralized systems (states, districts, schools), NPST functions as a harmonizing reference that allows local adaptation while maintaining national benchmarks.

## **Implementation Challenges and Realities in The Indian Context**

### **1. Scale and Diversity**

India is vast in terms of linguistic, socio-economic and infrastructural aspects. The society is very much heterogeneous contextually. 35-37% of the total population lives in urban areas and remaining large population in the rural settings. The history has witnessed one-size-fits-all approach has never proved to be effective for the country.

### **2. Awareness and Ownership**

Awareness of stakeholders is an important factor in the effective implementation of any official document. As NPST has just entered our educational system, the teachers, head teachers, and teacher educators are not aware of its purpose, objective and how to implement it in their profession. As awareness is low, the ownership has not taken its place. Ownership of standards by the teachers in their teaching profession is required.

### **3. Capacity of Teacher Education Institutions (TEIs)**

Even though NPST came out as per the suggestions of NEP 2020, the teacher education institutions are not prepared for it. NPST needs capacity building of TEIs in terms of faculty development, updated syllabus, practical components and strong school partnerships. NPST has not aligned in the pre-service curricula. There are resource constraints and limited practicum-quality assurance.

### **4. Quality and Relevance of CPD**

One out of the three core domains of NPST is professional development. Professional development of teachers is linked with seniority in NPST. But in reality the continuous

professional development is limited to attending workshops, seminars without any follow-ups and classroom-based coaching. The CPD programs remain generic, one-shop and workshop-centric. These programmes are not purposive and objective based.

## **5. Assessment and Appraisal Systems**

In the NPST, there is requirement of formative assessment. Appraisal must be formative—supportive rather than punitive—and include multiple sources of evidence (classroom observation, portfolios, student outcomes). While NPST can underpin appraisal, current evaluation systems may lack robust instruments, external moderation, or safeguards against bias.

## **6. Resource Constraints and Incentives**

Implementing NPST-linked reforms—induction programs, mentoring, teacher performance management—requires financial resources and administrative bandwidth. Without adequate incentives (career pathways, recognition), teachers may not prioritize standards-based development (Mohalik, et.al.(2024)).

## **7. Political and Bureaucratic Will**

In a country like India, education is very much influenced by politics and bureaucracy. The reforms in NPST need political commitment and bureaucratic continuity. Frequent changes in policy direction or leadership can disrupt long-term NPST adoption and scaling.

## **Recommendations to Strengthen NPST's Impact**

To make NPST a more powerful reform for teacher professionalism and quality education, the following measures are recommended:

### **1. Promote Localized, Practical Guidance**

NPST is new to the country, first it needs to be introduced in the knowledge of the wider society. India is very much heterogeneous in terms of culture and languages. There is a need to develop practitioner-friendly tool kits, lesson examples, and short videos especially in regional languages that translate NPST competencies into everyday classroom practices. So that every teacher can understand its vision and purpose. Teacher's must be given practical guidance towards the implementation of NPST through workshops and seminars (Patil, & Karad, 2022).

### **2. Integrate NPST into Teacher Education Curricula and Practicum**

Pre-service and in-service are the two sides of teacher education. NPST's successful implementation requires TEIs embed NPST-based competencies into syllabus of teacher education, assessment of student-teachers, and supervised practicum experiences (Dsilva. Et.al(2025)). Pre-service teachers can be given training of competencies through school

teaching practice. This can also be successfully done by Strengthening partnerships between TEIs and schools to facilitate meaningful induction.

### **3. Build a Tiered CPD (Continuous Professional Development) Ecosystem Linked to NPST**

It is recommended that CPD should be tied up with NPST in a well-defined manner. The CPD pathways can be aligned to NPST strands in a way that there are clear learning outcomes. This can be done through two ways: classroom-embedded tasks and micro-credentials. Classroom-embedded tasks can be made more practical and include the knowledge gained through professional development activities. Through micro-credentials, teachers can get small, competency-based certifications for mastery of specific professional skills (Evans, 2008). CPD modalities can include promotion of mentoring, lesson study, and communities of practice.

### **4. Reform Appraisal toward Developmental Approaches**

Strengthening NPST requires development of robust appraisal instruments tied to NPST which will emphasize formative, coaching-oriented feedback. It will be fruitful if clear appraisal instruments will be framed so that teachers can get timely continuous feedback regarding their performances. Multiple measures like (observations, portfolios, student learning evidence) can be used to ensure transparency and moderation to reduce bias in the process. Classroom observations, teacher portfolios can be taken as evidences for appraisal.

### **5. Constructive Use of Technology**

NPST dissemination is a critical element in its initial years. The dissemination can be faster through the use of digital technology. NPST implementation can be easy through low-cost digital platforms for NPST dissemination, CPD delivery, peer networks, and e-portfolios. Digital inclusion could be beneficial in this context. Ensure digital inclusion—offline resources and blended models for contexts with connectivity constraints.

### **6. Create Incentives and Career Pathways**

Incentives and rewards always play an important role in motivation of individuals. Demonstration of competencies by the teachers can be rewarded through the school administration. Career pathways can be well defined by the authorities and teachers can be provided recognition for their work. The recognition can lead them closer to teacher professionalism (Baggini, 2005). Fellowships can be given to deserving teachers. These teachers will also become role model for other teachers.

### **7. Monitor, Evaluate, and Iterate**

For successful implementation of NPST it is required to Set up a monitoring framework to track NPST adoption, teaching practice changes, and student outcomes (Patil & Karad, 2022).

Data can be used to refine standards, CPD modules, and implementation strategies. Scale to measure the NPST competencies can be developed to evaluate the progress.

## **8. Foster Multi-stakeholder Ownership**

NPST has its stakeholdership in teachers as well as teachers' unions, school leaders, teacher educators, parents, and community. These people play an important role in the dissemination of education. They can also play an important role in NPST adaptation and implementation to build broad-based legitimacy and reduce resistance. They are need to be included in NPST ecosystem.

## **Conclusion**

The dream of viksit bhara 2047 and quality education envisaged through national policy of education (2020) is possible through national professional standards for teachers (NPST). The National Professional Standards for Teachers have the fine potential to be a catalytic instrument for strengthening teacher professionalism in India but only if they are translated into practice through purposeful, context-sensitive implementation. NPST is aligned with the NEP 2020 as a part of fundamental principle which states that "teachers and faculty are the heart of learning process" (NEP 2020, Page 5). The NEP 2020 visions India as a 'vibrant and knowledgeable' society where teachers play and important role in building future generation. NPST envisions to bring teacher professionalism and identity of teachers. NPST is framed to guide and shape teacher identity, guide pre-service and in-service development, structure appraisal and career progression, and ultimately improve classroom practice and learner outcomes. The successful implementation of NPST requires guidance at local level, incorporating bottom-up approach. Capacity-building in teacher education institutions and well-defined monitoring system can prove to be beneficial. NPST has provided a valuable direction towards teacher quality which requires joint efforts in terms of investments in teacher support, institutional capacity and adaptive leadership. Teacher professionalism will flourish like a flower when support systems work together for a major goal.

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### **School Libraries: Supporting Vocational Education and Skills Development under NEP 2020**

School libraries contribute positively to the enhancement of vocational education, which is underappreciated. Beyond the long-standing role of being home to books, contemporary school libraries are also changing into places of learning and inclusion to encourage the power of skills, career awareness, and lifelong learning that are key priorities in the National Education Policy (NEP) 2020 of India. School libraries in vocational education environment offer industry-specific materials (technical manuals, reference books, trade journals, e-resources and multimedia) to access industry specific content. The materials enable the students to close the gap between theory and practice, which supports hands-on training and competency-based learning highlighted in NEP 2020. Libraries facilitate multidisciplinary learning options which are flexible by providing updated and varied learning materials. NEP 2020 puts a great emphasis on vocational exposure at the school level, digital literacy, and hands-on learning. The school libraries are in a direct contribution to these objectives as they are the centers of information literacy, digital skills, and self-directed learning. It is a role of a librarian to show students how to use credible information, learn to use digital platforms, and gain research skills competencies that will make them highly employable in a fast-paced workforce.

Equity, inclusion and access are also highlighted in the policy. The school libraries facilitate these principles by availing learning resources to both the advantage and the disadvantaged students to enable them to have equal chances of acquiring skills. Fully furnished libraries contribute to the minimization of the digital divide by providing common access to technology and internet learning resources. NEP 2020 emphasizes career guidance and holistic development. This vision has been backed by school libraries that provide career, entrepreneurship, soft skill and workplace ethics information. Librarians, in cooperation with the vocational teachers, also help in project-based learning, internships and community-based educational programs. As part of the NEP 2020, empowerment of trained library professionals and the strengthening of school libraries is the only way to successful implementation of the vocational education reforms. The understanding of school libraries as the part of the skill education will contribute to the learning outcomes and will contribute to the development of confident, skilled, and future-ready learners.

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# **Sentiments and Emotions Analysis of SWAYAM Mobile App Reviews: A Text Mining Approach**

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## **Abstract**

In this study, we conduct sentiment analysis of user reviews for the SWAYAM mobile app, a Government of India (GOI) initiative that provides a digital learning platform. Its goal is to assess user satisfaction, identify common issues, and suggest improvements. The purpose of it is to gauge user satisfaction, uncover common problems and offer recommendations. Leveraging the Google Play Store reviews from 2017 to 2024, the analysis performs sentiment polarity scoring, rating distribution, word cloud visualisation, emotion frequency mapping, topic modelling and temporal analysis. The results demonstrate that users' reviews exhibit a bimodal sentiment distribution, with 53.1% rating 5 stars and 21.3% rating 1 star. Even as users of SWAYAM consistently appreciate the quality of the educational content it offers, their dissatisfaction is mainly due to technical issues, such as crashes, login failures, and update issues. Review activity peaked in mid-2019 and early 2021, coinciding with periods of heightened demand for digital education during the COVID-19 pandemic. Topic modelling identifies eight main themes, including app performance, app updates, login issues, and perceptions of SWAYAM as a government initiative. Sentiment analysis indicates overall positivity, but negative feedback is detailed and pertinent, particularly concerning usability and reliability. The study highlights SWAYAM's dual challenge: it must continue to deliver inclusive educational content while addressing recurring technical issues. Recommendations involve enhancing application stability, optimising updates, and improving user support to facilitate increasingly positive experiences and reinforce its standing within India's digital education ecosystem.

**Keywords:** MOOCs, SWAYAM, Mobile Application Reviews, Sentiment Analysis, Topic Modelling, User Satisfaction, Educational Technology

## **Introduction**

User reviews for mobile applications serve as a valuable resource of feedback that can be utilised to inform iterative product development (Ahmad et al., 2023). Sentiment analysis, a widely adopted method within text mining and natural language processing, enables researchers and developers to gauge users' sentiments, interests, and complaints (Siallagan & Wijayanto, 2023). Considering the vast number of applications available on platforms such as the Google Play Store, analysing such feedback is essential for gaining insights into

user experiences, thereby supporting efforts to promote long-term adoption.

Existing work has shifted from binary sentiment classification to more advanced ones, including aspect-based sentiment analysis, deep learning-based classification, and temporal sentiment modelling (Fahim et al., 2024). These innovations enable fine-grained awareness of user perceptions and support conventional quantitative metrics such as star ratings. Research indicates that sentiment analysis not only will mirror user interaction with applications on a micro level but also can predict long-term success and retention (Sorbo et al., 2021; Gezici et al., 2019). Nevertheless, a lack of integrated models remains that incorporate polarity scoring, thematic clustering, emotion frequency analysis, and temporal tracking, among other features (Luiz et al., 2018; Gao et al., 2020).

In this context, various government-driven platforms such as SWAYAM are unique (Shaikh, 2023). Developed to democratise quality learning resources in India, the success of SWAYAM relies not just on the calibre of its content but also on its use and technical efficiency (Kumar et al., 2025). Content quality may not be a significant concern; however, the lack of solutions to technical problems can undermine user confidence and adoption of the system (Arshid et al., 2024). In this context, we conduct a multidimensional sentiment analysis of the SWAYAM Play Store reviews in this study. Through sentiment scoring, word frequency analysis, and topic model generation, as well as temporal trend tracking, this study aims to provide both diagnostic insights into user perceptions and strategic solutions for maintaining engagement.

## **Objectives**

1. To study users' sentiments and emotions of the SWAYAM app using sentiment scores and word clouds.
2. To analyse the distribution of ratings for user satisfaction.
3. To examine the growth of user feedback over time.
4. To identify the dominant themes and concerns via topic modelling and emotion frequency mapping.

## **Literature Review**

Sentiment analysis is a technique used to detect the emotions of the opinions expressed by users or respondents in a digital environment. Sentiment analysis is largely performed using techniques such as natural language processing, text mining, Machine learning or Artificial Intelligence. P. M. Moreno-Marcos et al. (2018) in their study compared various machine-learning algorithms that can be used for sentiment analysis. They observed that 'random forest' and 'one lexicon' based methods are best as they use word dictionaries as a vocabulary control tool. Sentiment analysis of user-generated reviews has also been found to provide deeper insights into user satisfaction than numerical ratings (Pande et al., 2025). Luiz et al. (2018) show that feature-based sentiment analysis captures nuanced user opinion, which star ratings often are unable to represent. Gezici et al. (2019) also confirm that the neural sentiment models are useful for predicting user ratings, which highlights the analytical potential of textual feedback. Di Sorbo et al. (2021) note that user-reported technical complaints, specifically crashes and updates, are strongly associated with negative ratings. Although these studies validate that sentiment analysis plays an important role, they

are mainly concentrated on the prediction performance (e.g., level of accuracy and/or correlation) under given settings by providing very few explanations towards what exactly leads to a polarised user experience. The recent developments in machine learning methods have improved sentiment classification performance by building complex architectures. Yang et al. (2021) show that multimodal approaches improve the accuracy of sentiment detection using context. Gifari et al. (2024) reported high accuracy rates by using hybrid deep learning models. However, these studies mostly focus on the performance of a model and pay less attention to the interpretability and actionable insights. Gao et al. (2022) expand the notion of sentiment analysis by incorporating emotion detection to better comprehend public reactions in crisis situations. Fahim et al. (2024) suggest that the evolution of user attitudes over time can be uncovered through temporal sentiment analysis. Pınarbaşı (2024) also suggests that tapping into sentiment can reveal hidden dissatisfaction in reviews of mobile applications.

When it comes to the field of education, Ahmad et al. (2023) show that sentiment analysis is highly capable of capturing learners' satisfaction with their digital learning platforms. Siallagan and Wijayanto (2023) employ topic modelling on crowdsourced data to identify what is most concerning to users. Nevertheless, the work does not seek to extract user-level information, and, to the best of our knowledge, their corpus is used only for offline privacy controls. Therefore, studies about state-funded educational interventions are scarce. To fill the gap in the literature, this research paper uses a composite analytical methodology that combines sentiment analysis, emotion plotting, topic modelling, and time series analysis to understand learners' experience with the SWAYAM Mobile App.

Further, some of the significant studies we discussed below in Table 1 focus on sentiment analysis, topic detection, temporal analysis, and feature generation in mobile app reviews using various ML and NLP methods. These methods also vary from traditional classifiers, such as SVM or logistic regression, to state-of-the-art transformer-based models and ensemble approaches, with some focusing on specific domains or multilingual settings. This comparative analysis is pertinent to the research inquiries as it synthesises diverse approaches and findings concerning sentiment precision, user satisfaction correlation, temporal dynamics, thematic extraction, and methodological efficacy in the analysis of application reviews.

Table 4.1: Literature Review

| Study                      | Sentiment Analysis                                                                      | User Satisfaction                                                       | Temporal Feedback Trends                                           | Theme and Emotion Extraction Quality                                         | Methodological Effectiveness                                                              |
|----------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| (Yang et al., 2021)        | Sentiment prediction integrated with online topic modelling.                            | Sentiment towards app features linked to emerging issues over versions  | Dynamic topic and sentiment analysis over app releases             | Online topic modelling captures evolving user concerns                       | Online topic modelling and sentiment prediction strategy validated by developer survey    |
| (Luiz et al., 2018)        | Sentiment analysis is more accurate than star ratings in capturing user sentiment.      | Sentiment scores provide richer info than star ratings for satisfaction | Not focused on temporal trends                                     | Topic modelling organises features into semantic topics with sentiment       | The framework combines topic modelling, sentiment analysis, and a summarisation interface |
| (Verma and Vashisth, 2024) | The RoBERTa-base model was used for sentiment analysis with spam filtering.             | Sentiment distribution over time linked to user satisfaction patterns   | Sentiment timeline visualisation for evolving user opinions        | Word clouds and keyword-specific sentiment analysis identify concerns        | Advanced NLP model (RoBERTa) processes multilingual and emoji-containing reviews          |
| (Ahmad et al., 2023)       | VADER and machine learning show positive sentiment towards SWAYAM MOOCs                 | Sentiment analysis complements rating analysis for user satisfaction    | Sentiment trends analysed via compound scores and chi-square tests | Sentiment analysis highlights appreciation for content and delivery          | Machine learning enhances sentiment detection in MOOC reviews                             |
| (Fahim et al., 2024)       | Advanced NLP methods applied for sentiment extraction.                                  | Sentiment analysis provides practical insights into user preferences    | Case studies illustrate temporal sentiment changes                 | Visualisation techniques support the understanding of sentiment distribution | Sophisticated NLP pipeline for large-scale Google Play Store review analysis              |
| (Brahmani et al., 2024)    | VADER sentiment tool used for positive, negative, and neutral classification            | Sentiment categories correlated with user satisfaction and app success  | Visualisation supports temporal sentiment analysis                 | Python-based pipeline enables large-scale sentiment extraction               | Efficient and flexible sentiment analysis framework for Google Play reviews               |
| (Gifari et al., 2024)      | The hybrid CNN-BiLSTM-GloVe model achieves an accuracy of 93.95% in sentiment analysis. | High accuracy supports a reliable user satisfaction assessment          | Temporal trends are not the primary focus                          | A hybrid deep learning model captures nuanced sentiment features             | Combines CNN, BiLSTM, and word embeddings for superior sentiment classification           |

## Research Methodology

This study employs a mixed-method research approach based on text mining to explore learners' perceptions and behavioural patterns through reviews posted about the SWAYAM mobile application. The methodological framework integrates sentiment analysis, emotion analysis, temporal trend evaluation, and user engagement analysis using natural language processing (NLP) tools.

## **A. Data Collection**

The dataset was obtained from the AppFollow platform, which compiles user reviews from the Google Play Store. A total of 13,084 review entries were gathered for the SWAYAM application. Each entry included metadata such as submission date, rating (1–5 stars), review text, likes/dislikes, developer responses, review language, and version history. Due to concerns about data quality, reviews with incomplete content were excluded from the analysis. After data cleaning, a total of 13,082 valid review entries were retained for processing. The data were stored and analysed in .csv format using Python libraries (pandas, matplotlib, TextBlob, VADER).

## **B. Data Preprocessing**

The dataset was cleaned by removing null reviews, converting dates into Year-Month format, and standardising review text to lowercase, along with removing special characters. Key variables, including Review, Rating, Likes, Dislikes, Developer Reply, and Reply Date, were extracted to facilitate sentiment analysis, engagement measurement, and response assessment.

## **C. Data Analysis**

The analysis was carried out using tools such as Python, specifically utilising the libraries pandas, matplotlib, TextBlob, and VADER, within Jupyter or Colab environments. TextBlob was used to calculate polarity scores, ranging from -1 (indicating negative sentiment) to +1 (indicating positive sentiment). Reviews were classified as Positive (Polarity > 0.1), Negative (Polarity < -0.1), or Neutral (otherwise). For analysing emotional tones such as joy, neutrality, and anger, the VADER analyser was utilised. The monthly compilation of reviews and responses clarified the temporal patterns of user engagement and platform responsiveness.

## **Data Analysis and Interpretation**

The Data Analysis and Interpretation section provides comprehensive insights using statistical, textual, and visualisation techniques to examine user reviews systematically. Sentiment, engagement, and responsiveness patterns were identified through polarity scoring, temporal trends, and correlations between ratings and text.

## **A. Rating Analysis**

The distribution of user ratings for the SWAYAM mobile application on the Google Play Store reveals a highly polarised pattern of user experience. Figure 1 shows the dominance of 5-star ratings, indicating that a significant segment of learners perceives the application as valuable and practical. These positive evaluations likely reflect satisfaction with aspects such as high-quality educational content, ease of accessibility, and a user-friendly interface.

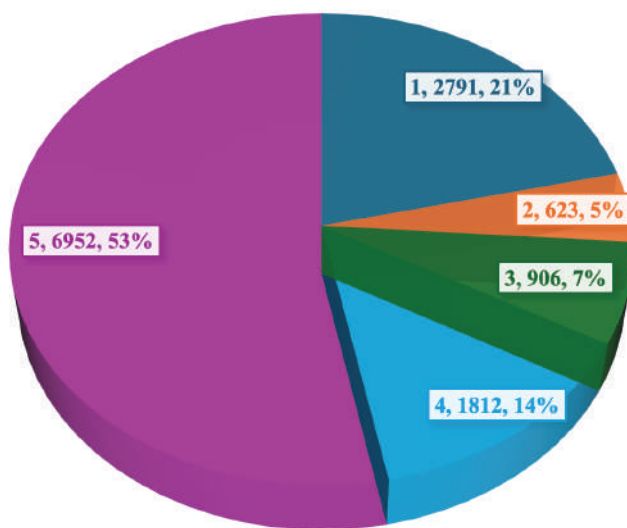


Figure 4.1: Rating Analysis

Conversely, the second-largest cluster of ratings resides in the 1-star category, signifying profound dissatisfaction among numerous users. This indicates that some learners are not satisfied and face problems when using the app and mobile web, which affects technical performance, causes crashes, results in slow load times, and leads to navigational quirks and inconsistent satisfaction levels. 2, 3, and 4 stars are less abundant in the mid-tier of ratings. This uneven distribution across these ratings also helps explain why users do not usually have a moderate experience.

Simultaneously, this presents both opportunities and challenges for developers. The volume of 5-star reviews shows the potential and perceived value of the application; however, the substantial number of 1-star reviews necessitates immediate attention. By addressing ongoing technical issues and providing a more seamless user experience, coupled with transparent updates, the development team can help bridge this satisfaction gap and cultivate a more reliable and enjoyable learning environment for the community.

## B. Periodic Trend of User Reviews

The cyclical pattern observed in user reviews of the SWAYAM mobile application provides significant insight into the evolution of user engagement and satisfaction over time. Since its inception in 2017 through early 2021, the observed spikes in reviews (illustrated in Figure 2) indicate substantial increases, notably in mid-2019 and again in early 2021, with each period recording over 900 reviews per month. These surges correlate with broader educational trends, including the nationwide impetus for digital learning during the COVID-19 pandemic, during which SWAYAM emerged as an essential tool for remote education. Consequently, this period naturally elicited an influx of user feedback, reflecting heightened usage during these phases.

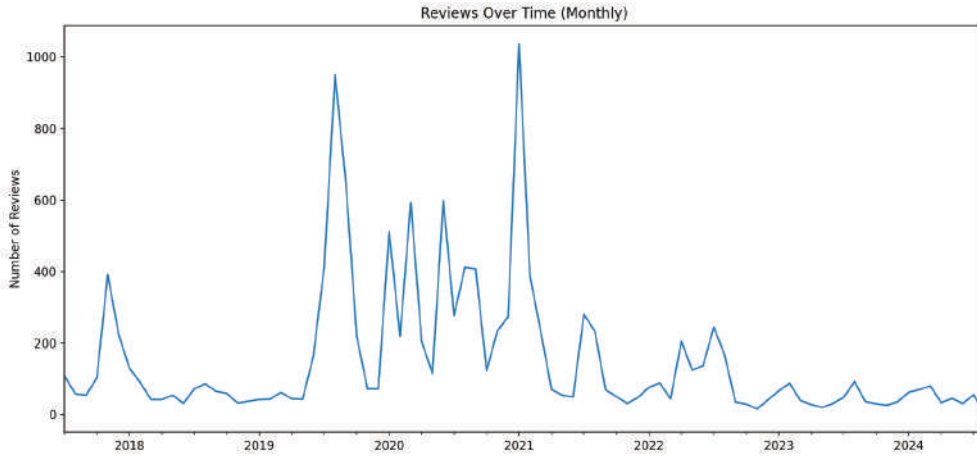


Figure 4.2: Reviews Over Time

Additionally, from the latter half of 2019 to 2021, there will be significant fluctuations with little concern, but consistently high numbers of sects. This growth results from rapid user expansion and diverse interactions with the platform, both positive and negative, as the company scales, introduces new features, and faces technical difficulties. The timeline coincides with the years of lockdown in India, during which reliance on online platforms reached its peak.

The number of reviews tends to decline after 2021, following a lower and steady pattern from 2022 onwards. This may indicate several possibilities: a shift back to hybrid or offline learning, a plateau in new user acquisition, or a decline in app activity. The sharp rise and fall in reviews clearly reflect how SWAYAM's visibility and usefulness reached their peak during educational disruptions and are now struggling to remain relevant in the long term. To stay competitive, the platform must continue to offer easy usability, reliable technology, and new products and services that align with learners' evolving digital expectations.

### C. Topic Modelling

Table 2 shows that the most prevalent theme, App Performance Issues, reflects many users' complaints about slow loading, video playing and downloading issues. These grievances suggest that countless students experience intermittent content availability. This problem cuts to the very core of what the app is supposed to do: serve as a trusted resource for teaching and learning. Close cousins to this are Update Problems, in which the phrases "update," "does not," and "version" provide recurring evidence that new releases often include bugs or break basic functionality. These two themes taken together highlight that technical dependability continues to be a crucial obstacle to user satisfaction.

| Theme                         | Words                                                        |
|-------------------------------|--------------------------------------------------------------|
| <b>App Performance Issues</b> | "Working", "Video", "Slow", "Download", "Properly"           |
| <b>Learning Platform</b>      | "Learning", "Platform", "Online", "Portal"                   |
| <b>Update Problems</b>        | "Update", "Work", "Doesn't", "Version"                       |
| <b>Student Experience</b>     | "Application", "Knowledge", "Students", "Experience"         |
| <b>Educational Value</b>      | "Useful", "Education", "Free", "Courses", "Quality"          |
| <b>User Experience</b>        | "Learn", "Helpful", "User", "Friendly", "Interface"          |
| <b>Login Issues</b>           | "Login", "Can't", "Sign", "Problem", "Unable"                |
| <b>Government Initiative</b>  | "Initiative", "Government", "India", "Swayam", "Certificate" |

Table 4.2: Topic Modelling

The name of the Learning Platform reflects the app as an organised online education service. At the same time, participants often mention SWAYAM as a site of organised learning, even with technical issues, and seem to view it as a digital classroom. Supporting this, the Student Experience theme highlights how students make sense of the app personally, emphasising how the app helps them learn and complements their university studies. On a positive note, Educational Value and User Experience constitute the focal points, with reviews containing terms such as “useful,” “free,” “courses,” and “quality,” praising the availability of organised, complimentary education. References to an “user-friendly” or “helpful” interface suggest that the design is welcoming and encouraging for many learners.

Two additional themes offer further insight. Login Issues, which frequently mention “login” and “problem,” reveal ongoing access difficulties that could discourage continued use. The Government Initiative theme, finally, emphasises SWAYAM’s symbolic function, representing “a part of the Indian push to make affordable and accessible education available to all.” As Professor de St. Aubin observes, “The words ‘initiative’ and ‘certificate’ imply that learners value not only the courses but also the government’s role in expanding access to higher education.” Overall, topic modelling reveals a dual reality: SWAYAM is esteemed for its free learning, supported by government credibility; however, persistent technical issues, primarily related to performance and disconnections due to updates, remain significant barriers that require urgent resolution.

## D. Most Frequent Emotions in Reviews

The primary theme identified is the positive sentiment shown in Table 3, characterised by the utilisation of words such as " good, " " nice, " " best, " " excellent, " " great, " and "helpful. " These terms convey a strong sense of gratitude for access to the application, its user interface, and the learning support it provides. Consequently, this language indicates that users generally hold a favourable view of the SWAYAM online learning resource system and perceive it as applicable.

The theme of educational value is just as relevant as the theme of free access, as the college often mentions courses, learning, students, and the act of teaching itself. This reflects that

learners are not only consuming the app but also utilising its academic content. Reviews generally link SWAYAM to personal learning, skill development, and formal education, emphasising its importance as a key online learning platform in India.

| Word      | Frequency | Word        | Frequency |
|-----------|-----------|-------------|-----------|
| App       | 4446      | Great       | 514       |
| Good      | 3258      | Time        | 509       |
| Nice      | 1061      | Useful      | 508       |
| Course    | 792       | Login       | 463       |
| Please    | 735       | Open        | 443       |
| Best      | 706       | Working     | 412       |
| Learning  | 669       | Students    | 355       |
| Courses   | 564       | Learn       | 327       |
| Update    | 556       | Swayam      | 317       |
| Excellent | 543       | Application | 317       |

*Table 4.3: Most Frequent Emotions*

However, the figures also reveal a downside: technical obstacles. Words like "update," "login," "open," and "working" frequently appear in user complaints. These are typically login problems, app crashes, or installation issues, all of which get in the way of learning and get very frustrating for the user. There is a request formality expressed through "please" and its usage that can be interpreted as an appeal to the user on Yelp, a request for action rather than a complaint, implying that learners care about what has been provided and are asking politely for it to be improved. This is indicative of loyalty to and an intention to persist in using SWAYAM after the issue is resolved.

Additionally, the repeated use of words such as "app," "SWAYAM," and "application" guides navigation in the "right direction," which is towards SWAYAM, and anchors SWAYAM in the mind as a "government-promoted educational initiative." In general, reviews are more likely to reference the quality of the content, ease of use, and educational outcomes, but see technical issues and responsiveness as causing some problems. Solving these problems can lead to more satisfied users who can trust the system and continue using SWAYAM.

## E. Distribution of Sentiment Scores

The distribution graph of the sentiment score provides a clear indication of how users emotionally react with the SWAYAM mobile application. In Figure 3, Sentiment polarity is present on the x-axis in the range from -1 (very negative) to +1 (very positive), and the frequency of reviews in each range is on the y-axis. The graph is not a smooth positive-negative separation, but rather a multi-modal distribution that highlights the diversity of sentiment per user. The prominent peak between 0.4 and 0.5 indicates that most users have a relatively neutral perception of the application. This observation aligns with the language of terms such as 'good,' 'useful,' 'excellent,' and 'great,' which reflect the educational value, ease of study, and success facilitated by the platform.

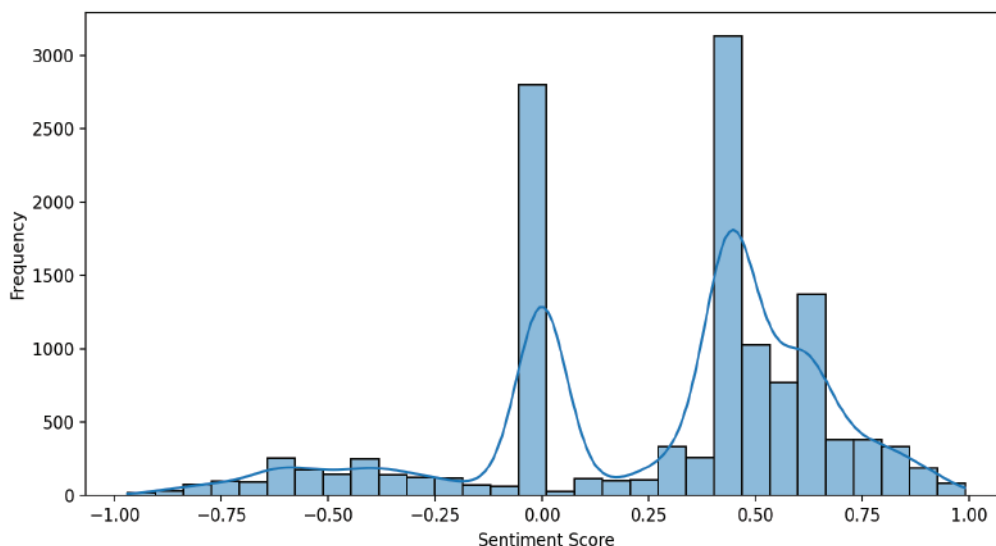


Figure 4.3: Distribution of Sentiment Score

A secondary prominent peak is observed near the neutral point (0,0). Reviews in this region typically fall into two categories: the first involving descriptions of the game itself rather than users' emotional responses, including issues relevant to the reviewer's utility, such as inability to log in (on the main page, rather than within the review section), failure to update, and other technical difficulties. This personal cluster is of critical importance, as it serves as a reminder that, although feedback is often driven by intense emotions as exemplified by the extreme cases in the previous cluster, users are not solely engaging in system criticism; instead, there are always constructive observations and requests that can guide improvements.

Furthermore, a smaller yet significant peak is observed around 0.5, representing a group of users with markedly stronger negative sentiments. Such feedback typically arises from prolonged frustration with technical issues, inadequate application maintenance, or usability challenges. Although less frequent than positive feedback, these criticisms highlight commonly overlooked flaws that require focused technical interventions.

Overall, the graph exhibits a leaning toward the positive side, which is favourable, as it suggests that the educational content of the application is generally satisfactory to most users. However, the presence of scheduling by neutral and negative clusters suggests a dichotomous experience: learners highly value the quality of the content, yet technical issues persist, hindering seamless engagement. Addressing these issues will be essential to restoring user confidence, reducing frustration, and ensuring long-term user retention.

## F. Positive Word Cloud

The positive word cloud generated from reviews of the SWAYAM mobile application highlights favourable aspects of user experience and demonstrates a broad spectrum of appreciation for the platform. Frequent words, such as "good," "nice," "excellent," "useful," "great," "helpful," and "best," shown in Figure 4, indicate that the application is, for many users, among the anticipated options, providing accessible and pertinent learning experiences.



Figure 4.4: Positive Word Cloud

Words such as free, opportunity, improvement, benefit, and growth further underscore users' recognition of the platform's contribution to personal and professional development. The availability of high-quality courses at no cost is particularly valued, as it supports skill enhancement, career advancement, and lifelong learning. Equally significant are terms such as support, solved, resolved, and kindly, which indicate that users have found customer service or technical assistance to be responsive, thereby contributing to a smoother and more satisfying educational experience.

Strongly positive expressions, including awesome, love, amazing, super, and wonderful, convey not merely satisfaction but genuine enthusiasm and an emotional connection. These reviews suggest that SWAYAM has had a meaningful impact on learners' lives by providing a convenient, engaging, and empowering means of pursuing education. Words such as improve, easy, simple, and friendly highlight the perception that the app's design and updates are increasingly user-friendly, thereby enhancing overall usability over time.

Interestingly, the frequent appearance of courteous expressions such as 'thanks,' 'please,' and 'kindly' reflects the polite and appreciative tone prevalent in many reviews—characteristics typically observed when users feel genuinely supported and benefited. Overall, the positive word cloud reinforces that, despite technical and usability challenges evident in negative feedback, a significant proportion of learner's regard SWAYAM as a valuable, enriching, and dependable educational resource. This positive sentiment demonstrates the platform's potential to maintain user loyalty and to expand further its role in democratising access to quality education across India.

The negative word cloud (Figure 5) is generated from reviews of the SWAYAM mobile application on the Play Store, illustrating the primary issues affecting user satisfaction. Terms such as "worst," "problem," "waste," "failed," and "error" indicate a general sense of dissatisfaction, often linked to technical deficiencies. These issues include the app becoming stuck, sign-in problems, loading difficulties, and limited offline access, which directly hinder the learning process and may even erode user confidence.

Sentiments such as disappointment, frustration, and inadequacy also illustrate how technical and design deficiencies impair learners' motivation and perceptions of the platform's educational value. Even more concerning are trust-related terms such as 'cancelled', 'scam', and 'wasting', which indicate potential issues like inaccessible courses, broken links, or session interruptions. These issues not only frustrate users but also undermine the reputation of SWAYAM as a government-supported initiative committed to reducing barriers to digital education for all. Overall, the negative discourse reflects a significant disconnect between user expectations and the application's performance. Learners today demand a consistently high-quality digital learning environment and recurring technical failures and usability issues hinder the achievement of this goal.

## H. Positive vs Negative Sentiments



are more prevalent, demonstrating appreciation for the platform's content and accessibility. The most frequently used term, “good” (3, 244 mentions), is followed by “nice” (1, 055), “please” (719), and “excellent” (540). These terms suggest that learners value the quality, utility, and educational support provided by the application. Words such as “useful,” “helpful,” “best,” and “free” underscore user satisfaction with both the learning benefits and the platform's open-access model. Strong emotional expressions, including “awesome,” “amazing,” and “super,” indicate enthusiasm and delight, while courteous expressions like “thanks” and “please” reflect user gratitude and respect for the service.

Conversely, negative reviews focus on technical and usability challenges. Terms such as “problem” (341 mentions), “worst” (302), “error” (145), and “crash” (63) signify ongoing issues related to app instability, including crashes, login failures, and unreliable performance. Negative emotive language, such as “disappointed,” “pathetic,” “useless,” and “irritating,” illustrates user frustration and dissatisfaction, particularly regarding reliability and user experience.

From a quantitative perspective, positive feedback significantly surpasses negative commentary. For instance, the most common positive term (“good”) appears nearly ten times more frequently than the predominant negative term (“problem”). Nonetheless, the detailed nature of negative feedback centring on crashes, errors, and access failures suggests that, despite appreciation for the educational content, user trust in the platform remains delicate.

To ensure sustained engagement, SWAYAM must continue to strengthen its core advantages, namely, high-quality content, accessibility, and learner support, while concurrently addressing recurring technical deficiencies. Addressing these issues is vital not only for enhancing user satisfaction but also for reinforcing the platform's credibility as a dependable digital education initiative.

## **Discussion**

The study reveals a highly polarised user experience with the SWAYAM mobile application. Over 50% of the reviews in the application store give a five-star rating, indicating strong enthusiasm for its educational value, free access to high-quality content, and overall usability. Conversely, more than 20% of users assign a one-star rating, reflecting considerable dissatisfaction, primarily due to technical issues, crashes, and login failures. The paucity of intermediate ratings underscores a bimodal distribution, in which experiences are predominantly either highly positive or highly negative, leaving little room for neutrality. This disparity suggests that, although the application functions effectively for specific learners, others encounter various barriers that hinder access to its intended benefits- likely due to device compatibility challenges and inconsistent updates.

A temporal analysis of reviews from 2017 to 2022 reveals peaks in user activity in mid-2019 and early 2021, corresponding to the global surge in e-learning prompted by the COVID-19 pandemic. These fluctuations underscored the platform's growing significance during a period when educational institutions relied heavily on digital learning modalities, while also exposing the challenges of scaling the system to accommodate such high demand. Post-2021, review volumes stabilised, indicating either a decline in dependency or greater user adaptation to the platform. A thematic analysis identified eight recurrent themes: (1)

app performance, (2) updates, (3) login issues, (4) user experience, (5) educational value, (6) student perception, (7) platform identity, and (8) public perception of SWAYAM as a government initiative. Technical issues are prevalent in negative ratings; however, reviewers who provide positive feedback consistently underscore the platform's accessibility, utility, and what Aarogya Setu has come to represent—an emblem of India's digital education initiative.

Generally, the distribution of sentiment indicates that the positive ones are more numerous, but the negatives are more focused and emotive. Fixing issues related to stability, improving login and success rates could lead to a significant increase in User Satisfaction. By addressing these weak points while capitalising on its strengths, SWAYAM has the potential to reduce the risk of polarisation in rating and enhance its status as a flagship initiative in India's e-learning sphere.

The results of this investigation reveal that technical instability, including login issues, application crashing and update-related problems, was the leading cause of negative sentiment among SWAYAM learners. Consequently, developers are encouraged to perform pre-release compatibility testing on popular Android devices from various vendors, especially the lower-end smartphones often used by learners in emerging countries. Furthermore, integrating real-time crash-reporting systems with more accurate in-application alerts during system outage and offline progress bars for video content helps reduce customer inconvenience. Such concentrated action, based on repeated subjects identified by the topic model and sentiment analysis, directly addresses technological deficiencies that degrade user trust and platform reliability. At the level of governance and policy, administrators of SWAYAM and their counterparts in the government system should put in place a mechanism for structured feedback to action, including a publicly available dashboard which indicates timelines of response as well as outcomes. This transparency can help build trust in the institution and convince users that issues are being addressed.

## **Conclusion**

The analysis of SWAYAM reviews from a sentiment perspective gives a neutral perspective. It is not without merit, however, and numerous 5-star ratings/reviews cite its low cost, free availability, and positive contribution to the development of government-supported education. Its user-friendliness, convenience, and interoperability with the national digital education policy are highly appreciated by users. There is even discontent, expressed through hundreds of one-star ratings, that highlights technical problems, including crashes, login issues, sluggish performance, and troublesome updates. These interruptions affect learning and trust, representing experience-discrepant elements driven by device, Internet, and updates.

The feedback is further separated based on content and sentiment. Positive comments emphasise educational value. In contrast, negative comments often focus on performance issues and frustrations with logging in, with the latter also frequently providing content commentary (particularly of the angry, yet detailed, variety). The study highlights both the potential and challenges in SWAYAM. For betterment, developers must first secure a technically stable platform and make updates easy to implement, ensuring reliability and support, and working on resolving issues related to usability, changing polar responses to consistent satisfaction and making SWAYAM a dependable, versatile digital education platform.

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His contribution to the current study is methodology and data analysis.

# **Bridging Aspiration and Reality: A Study on First-Year MBBS Students' Perceptions of the Medical Profession and Its Implications for Quality Vocational Education in the Health Sectoria**

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## **Abstract**

The medical profession has always carried a certain aura of prestige, often described as both noble and demanding. Yet, when first-year MBBS students step into this world, they don't arrive as blank slates. Their ideas are shaped by personal experiences watching a family member in hospital, perhaps alongside the weight of social expectations and what they have picked up during their schooling. This study looks at how these early perceptions take form, paying particular attention to the role of vocational elements such as early clinical exposure, hands-on skill training, and discussions on professional ethics. Rather than treating students' motivation and expectations as fixed, we ask how their first encounters with medical training may shift their sense of what being a doctor actually involves. Do these experiences encourage a stronger commitment to the profession? Do they make the textbook knowledge feel more "real"? And do they begin to nurture that elusive mix of responsibility and empathy that society expects from doctors? The answers, while preliminary, hint at ways medical educators might reshape the curriculum. A more vocationally grounded approach one that balances theory with practice and idealism with reality could help align students' early perceptions with the actual challenges and rewards of working in healthcare.

**Keywords:** MBBS Students; Perceptions; Medical Profession; Implications; Vocational Education.

## **Introduction**

In India, the medical profession still carries a special weight it is often spoken of with reverence, given its profound influence on health and well-being (Gupta, Prakash, & Nair, 2022). Yet, the road to becoming a doctor is rarely straightforward. It is a path shaped as much by challenges and doubts as by rewards and shifting perceptions (Sharma et al., 2021). For that reason, paying attention to how first-year MBBS students think and feel at the beginning of this journey seems important. Their attitudes and expectations may not only influence their own growth but also, over time, the vitality of the healthcare system itself (Goel & Rasanian, 2021).

This study takes a closer look at those early impressions what draws students into medicine, what they hope for, and where they may carry misconceptions. We focus on first-year MBBS

students at a Government Medical College in Madhya Pradesh, trying to understand the mix of enthusiasm, uncertainty, and social pressure that shapes their view of the profession.

The timing of this inquiry matters. Recent education reforms particularly the National Education Policy 2020 (NEP, 2020) and the National Curriculum Framework for School Education 2023 (NCFSE, 2023) have pushed for a model of learning that blends academic rigor with skill development and vocational training. These documents don't just speak of producing "employable graduates." They suggest something broader: a more holistic kind of education that sharpens critical thinking, nurtures creativity, and grounds students in ethical and social responsibility.

In medicine, this emphasis appears especially relevant. Textbook knowledge, on its own, is never enough. Students need repeated opportunities for hands-on experience, exposure to real patients, and space to reflect on the responsibilities that come with the white coat. Both NEP 2020 and NCFSE 2023 highlight the importance of weaving values such as empathy and professionalism into training, not as add-ons but as essentials. The aim, at least on paper, is to prepare young doctors who are not only competent but also socially aware and ethically steady (MCI, 2023).

Our work, therefore, sits at the intersection of these reforms and the lived reality of medical students. By examining their perceptions, we hope to capture early signals where motivation is strong, where gaps in understanding may exist, and where education could do more. Such insights, we believe, can help shape better interventions: orientation programs, mentorship, or curriculum tweaks that bring students' expectations closer to the actual responsibilities of medical practice.

This research does not claim to offer definitive answers. Instead, it contributes to an ongoing conversation about medical education in India about how young people imagine the profession when they enter it, and how schools and policies can guide those imaginations toward a more balanced, realistic, and socially responsive understanding.

## **Literature Review**

Earlier research has pointed to at least ten distinct dimensions of medical professionalism, though interestingly, fifth-year students often showed a slight drift towards more self-focused attitudes compared to their first-year peers (Klemenc-Ketis & Vrecko, 2014). Other work has emphasized the tangled web of factors that draw students into medicine in the first place some cite a wish to serve the poor, others mention financial security, and many refer to personal growth or prestige as motivating elements (Tiwari et al., 2016). Perceptions, of course, are not static. Reimer and colleagues (2019), for instance, found that what first-year students described as seven domains of professionalism had narrowed to five by the second year, suggesting a process of adjustment perhaps even disillusionment as training progresses. Together, these studies seem to suggest that early interventions and consistent mentoring are crucial if schools want to shape not only students' skills but also their professional identity.

Indian studies mirror some of these global patterns while adding local nuances. Gupta, Prakash, and Nair (2022) reported that most first-year MBBS students were satisfied with their choice, with familiar reasons helping others, earning money, and achieving personal

development again surfacing as central. They also noted that orientation programs and foundation courses eased anxiety and boosted students' confidence in those formative weeks. Yet, the picture is not entirely rosy. Other researchers argue that professionalism still needs stronger emphasis, with subtle signs of self-centredness creeping in as training progresses (Sharma et al., 2021; Arshad et al., 2021). Similar concerns have surfaced in studies examining the perceptions of students immediately after the one-month foundation course, which, while useful, appears insufficient to fully instill the values expected of future doctors (Vyas, Joshi, & Sheth, 2020; Jain & Verma, 2021).

## Methodology

**Sample Selection:** Eighty first-year MBBS students from a Government Medical College in Madhya Pradesh was selected for this study using purposive sampling. Purposive sampling was chosen to ensure representation from the target population while considering factors such as diversity in gender, socioeconomic background, and academic performance.

**Tool for Research:** A questionnaire-based survey was utilized as the primary tool for data collection. The questionnaire was designed to gather information on the attitudes, expectations, challenges, rewards, concerns, and misconceptions of first-year MBBS students regarding the medical profession. The questionnaire comprised more closed-ended and few open-ended questions to allow for quantitative and qualitative analysis.

**Data Collection Procedure:** The survey was administered through google form. The researcher provided a brief explanation of the study objectives and instructions for completing the questionnaire. Participants were given sufficient time to complete the questionnaire anonymously.

**Data Analysis:** Quantitative data collected through closed-ended questions were analysed using simple statistics such as percentages. Qualitative data obtained from open-ended questions were subjected to thematic analysis to identify recurring themes and patterns in the responses.

**Limitations:** The study's findings may not be generalizable beyond the specific context of Government Medical College in Madhya Pradesh. Self-reporting bias may influence the accuracy of responses. The cross-sectional design of the study limits the ability to establish causal relationships.

## Objectives:

1. To investigate the initial attitudes and expectations of first-year MBBS students towards the medical profession.
2. To explore the factors influencing first-year MBBS students' perceptions of the challenges and rewards associated with pursuing a career in medicine.
3. To identify potential areas of concern or misconception among first-year MBBS students regarding the medical profession and its responsibilities.
4. To identify the reasons and measures for success in NEET examination.
5. To suggest the implications for secondary stage school education, mainly vocational education.

## Results and Discussion

This study set out to explore how first-year MBBS students in India perceive the medical profession their early attitudes, expectations, and uncertainties. One of the first patterns to emerge from the data (Fig. 1) was the gender distribution: roughly one-third of students were male (35%), while nearly two-thirds were female (65%). At first glance, this imbalance may seem like a simple demographic fact, but it raises deeper questions about what draws young men and women into medicine, and perhaps just as importantly, what might be discouraging others. Are societal expectations nudging more women toward this field? Or does medicine appear to offer certain kinds of stability and respect that align more closely with the aspirations placed upon young women today?

Such patterns aren't trivial. How male and female students experience medical education their motivations, the pressures they face, and the barriers they encounter can differ in subtle but significant ways. This, in turn, challenges us to ask whether current teaching methods and institutional cultures are doing enough to foster inclusivity. Are some students navigating unspoken obstacles that others barely notice?

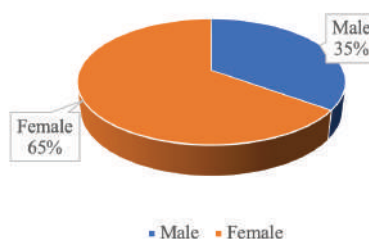


Figure 5.1: Gender Differences among students

Looking more closely at these variations can help shape meaningful interventions. For example, targeted mentorship, flexible learning pathways, or support systems that take into account diverse backgrounds may all help. If schools and colleges acknowledge gender disparities early on and treat them not as problems to be “fixed” but as realities to be addressed, they may succeed in building a medical education environment that feels more equitable and supportive for everyone.

The age profile of first-year MBBS students offers some telling clues about how students navigate the road to medical school (Fig. 2). A large share about 40% entered at age 20, while nearly a quarter (24%) started at 19. Only a small group (4%) managed to join at 18, and about a third (32%) were 21 or older. That last category points to repeaters or students who had to make multiple attempts before securing admission.

This pattern isn't surprising if we think about the way NEET preparation typically unfolds. Many students take their first shot right after Class 12, at 18, but success is often elusive. The cluster around age 20 suggests that the second or even third attempt is when most students finally cross the threshold. It underlines not only the competitiveness of NEET but also the persistence and sometimes privilege required to keep preparing year after year.

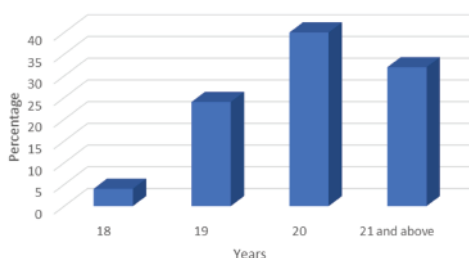


Figure 5.2: Students age while passing NEET

For schools, these numbers raise an uncomfortable but important question: are we doing enough to prepare students for such a high-stakes exam the first time around? Better guidance during the final years of school, more accessible coaching, and structured mentorship could give students a stronger start. At the same time, older entrants those who tried and failed before need a different kind of support, one that acknowledges their resilience but also the frustration and financial burden of repeated attempts.

In short, age distribution is more than just a demographic detail. It tells us something about the bottlenecks in medical admissions, the unevenness of preparation opportunities, and the importance of building a school education system that nurtures medical aspirations early, while also supporting those who take a longer, more difficult path.

Figure 3 gives an interesting snapshot of the subject choices students carried through Class 12 and how these may have shaped their NEET outcomes. Physics, Chemistry, and Biology (PCB) are non-negotiable, but the fourth subject varies depending on students' priorities. About a quarter (26%) opted for Physical Education, perhaps seeing it as a lighter load that left more time for NEET preparation. Others roughly 18% chose Mathematics, often with an eye toward keeping engineering as a backup. Smaller groups picked Hindi (16%) or Computer Science (14%).

The pattern suggests something that feels intuitive: students who stuck closely to the PCB track may have been able to devote more hours to exam-focused study, while those juggling additional subjects with heavier demands likely had to split their attention. Of course, correlation is not the same as causation, but it does raise a practical point: the choice of a fourth subject may subtly tilt the balance of a student's preparation.

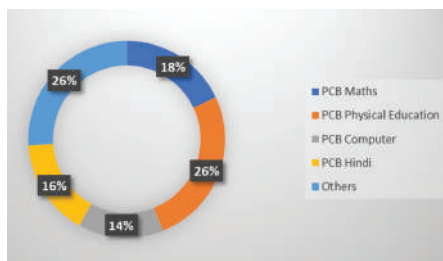


Figure 5.3: Subject combination in Class 12

For educators, this is worth keeping in mind when advising students at the school level. A “lighter” subject might give students breathing room, but it could also narrow their academic options later. On the other hand, choosing a demanding subject like Mathematics can open doors but may leave less time for NEET-specific practice. The right choice probably depends on the student's strengths, goals, and the kind of support they can access.

Future research could dig deeper here looking not just at subject combinations but also at how different students actually structured their study time, whether coaching classes filled the gap, and how much family or peer pressure factored into these decisions. That kind of detail would give a richer picture of how subject choices intersect with exam performance.

Figure 4 offers a glimpse into how firmly first-year MBBS students see medicine as their chosen path. A large majority 82% described MBBS as their primary career choice, which suggests a strong sense of commitment at the very start of their journey. Still, nearly one in five students (18%) admitted that medicine wasn't their only or even their first preference. That minority, while smaller, is telling. It hints at the range of pressures, backup plans, and shifting motivations that often accompany such a competitive field.

This mix of certainty and ambivalence matters. For those who entered medicine as their top choice, the challenge may lie in sustaining that early enthusiasm through years of demanding training. For others, who might have pictured different futures engineering, research, civil services, or even something unrelated to science the challenge is different: finding a way to make sense of their place in a profession they may not have originally envisioned.

Here, medical schools have an important role to play. Beyond the usual lectures and labs, students benefit from career guidance that helps them see not just one narrow path but the variety of directions a medical degree can lead public health, academia, administration, or specialized clinical practice. By recognizing these varied motivations rather than treating them all as identical, institutions can create a more supportive environment, one that helps students chart meaningful futures within or adjacent to medicine.

In short, career preference data isn't just about percentages. It's a reminder that students arrive in medical school with different levels of conviction, shaped by family expectations, personal ambition, or practical compromise. The more the curriculum and mentoring structures account for this diversity, the more likely we are to nurture not only competent doctors but also satisfied, well-grounded professionals.

Figure 5 highlights a striking divide: only 17% of the surveyed students managed to clear NEET on their very first attempt, while the overwhelming majority 83% got in after two or more tries. That imbalance says a lot about both the competitiveness of the exam and the persistence required to finally secure a seat.

What's particularly interesting is how these different entry pathways may color students' views of the profession itself. Those who succeed on the first attempt might carry a sense of confidence, even relief, that makes the medical journey feel slightly less intimidating. In contrast, repeaters who have faced setbacks, extra years of preparation, and often the emotional weight of failure may be more inclined to see medicine as a steep, exhausting climb. Neither perception is "wrong"; both are shaped by personal histories, academic resources, and the cultural narrative that surrounds NEET.

This raises an important point for educators. If medical schools can provide a supportive environment one that normalizes multiple attempts, offers structured mentoring, and reduces the stigma of being a "repeater" students may begin their training on a more equal emotional footing. Otherwise, the initial gap in perception could widen over time, affecting motivation and even career choices.

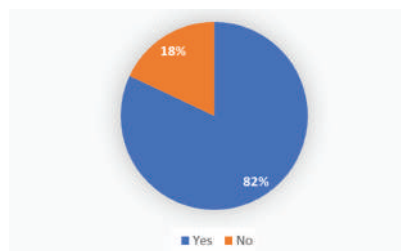


Figure 5.4: Is MBBS your first-choice career path?

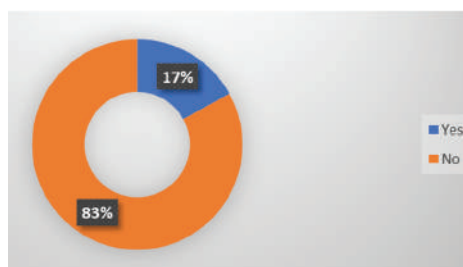


Figure 5.5: Did you join MBBS in your first NEET attempt

There's also space here for future research: do first-attempt entrants maintain their confidence advantage throughout medical school, or does it fade once everyone is subjected to the same workload? And how do repeaters' experiences arguably marked by resilience shape their long-term professional development? These are questions worth exploring to better understand how pathways into medicine shape the doctors who eventually emerge.

Figure 6 sheds light on how students prepared for NEET and how those choices may shape their view of medicine. More than half the respondents (51%) reported starting coaching in Class 11, which seems to be the most common timeline. A smaller but notable group (15%) began as early as Class 9 a sign of just how early the pressure to plan for medical school can begin. At the other end, about 11% relied solely on self-study, choosing not to attend any coaching at all.

These different pathways raise an interesting question: does the length or intensity of coaching affect how students perceive the toughness of medicine itself? Those who have spent years in structured programs may approach medical school with a mindset that the field is inherently grueling since their preparation for it already was. On the other hand, students who managed largely through self-study might see the profession through a different lens, perhaps as less intimidating or more under their own control.

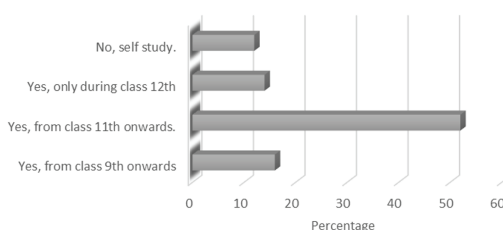


*Figure 5.6: Did you attend any coaching classes to prepare for NEET*

The findings point to something larger than just coaching trends. They invite us to consider the role of schools: if classroom teaching were consistently strong and aligned with NEET demands, would fewer students feel the need for years of outside coaching? And, just as important, does prolonged coaching actually prepare students for the realities of medical training, or does it mainly condition them for a single high-stakes exam?

These are questions worth exploring further. For now, what is clear is that the method of preparation whether coaching-heavy or independent does more than shape exam results. It may also leave an imprint on how students imagine the medical profession itself: as either an uphill struggle or a challenge within reach.

Figure 7 brings out a demographic divide that has long shaped access to medical education: most first-year MBBS students in the sample came from urban areas, while those from rural backgrounds formed a much smaller group. At one level, this isn't surprising urban centres generally offer more coaching institutes, better schools, and a culture that normalizes NEET preparation. Success, for these students, may feel more attainable simply because the resources are close at hand.

For rural students, the story is different. Limited access to coaching, fewer peer networks focused on medicine, and sometimes even basic infrastructure gaps make the path feel steeper. It's not just about the exam itself but about the environment in which preparation takes place. A sense of isolation academic and social can add to the perception that medical admissions are harder to crack.

This gap has clear implications for school education policy. If rural students are to have a fair chance, schools and state systems need to find ways to bridge resource disparities whether through digital learning platforms, traveling faculty, or targeted mentoring. At the same time, exposing urban students to the realities of rural health and education could balance perspectives, making the system more inclusive overall.

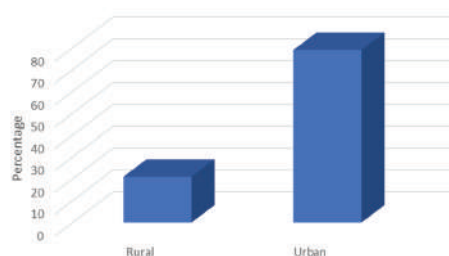


Figure 5.7: What is your residential background

In short, the urban–rural imbalance is more than a statistic; it reflects the uneven geography of opportunity. Unless consciously addressed, it risks perpetuating a cycle where medical education and eventually healthcare delivery remains skewed toward those who already have easier access.

Figure 8 shows that, for most first-year MBBS students, the decision to pursue medicine comes down to something quite simple: personal interest. Intrinsic passion and curiosity wanting to understand the human body, help patients, or simply follow a long-held dream stood out as the strongest motivating force.

Family influence, though less dominant, still mattered. A number of students pointed to parents or relatives in the field, or to the weight of family expectations, as shaping their choices. Peer influence, by contrast, seemed to play only a small role; few students credited their friends with swaying such a major decision.

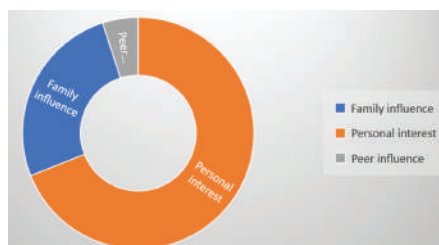


Figure 5.8: What motivated you to pursue a career in medicine

Taken together, these findings remind us that career paths are rarely shaped by a single factor. Instead, they emerge from a mix of individual drive, family background, and social context. For educators, the lesson may be that school systems should do more to nurture personal passions through exposure to healthcare settings, mentoring, or vocational programs while also being mindful of the different pressures families bring to the table.

Even though peer influence looks minor here, it may still be worth probing. Subtle signals from classmates or coaching peers could affect how students see themselves and their chances of success. A deeper look at this dynamic might reveal quiet but important ways that social networks shape career trajectories.

Understanding these motivations isn't just an academic exercise; it can help schools and policymakers design more supportive environments, ensuring that future healthcare providers enter the field for reasons that sustain them through the long and often difficult road ahead.

Figure 9 paints a largely upbeat picture: almost every student surveyed 76 out of 80 said they

were “very excited” about starting their medical journey. That level of enthusiasm is striking and suggests that, at least in the beginning, most students approach medicine with genuine passion and high expectations.

Of course, not everyone felt the same way. A small group, around 15 students, reported being only “moderately excited” or less. While they’re in the minority, their presence is worth noting. It may reflect lingering doubts, fatigue from the long grind of NEET preparation, or simply uncertainty about what lies ahead.

For educators, this mix of responses offers both opportunity and caution. The overwhelming positivity can be harnessed to build momentum enthusiastic students often engage more deeply if their energy is channeled into meaningful learning experiences. At the same time, overlooking the quieter group with lower excitement could leave them disengaged early on. Addressing their concerns through mentoring, peer support, or even small adjustments in teaching style might prevent discouragement from snowballing later.

In short, excitement levels are more than just a feel-good statistic. They give a glimpse into how students are entering medical school some with unshakable motivation, others already wary. Recognizing both ends of that spectrum is key to designing programs that not only sustain passion but also lift those who begin with uncertainty.

Figure 10 makes one thing very clear: for most first-year MBBS students, the real reward of medicine lies in helping and healing patients. Out of the 80 students surveyed, 54 placed this above everything else. That kind of response reinforces the idea that many young people enter medicine with an altruistic spirit, driven by the desire to make a tangible difference in people’s lives.

Money, while not irrelevant, came second. About 25 students cited financial stability as a key reward, but it was still far behind the pull of patient care. Interestingly, even fewer students pointed to “social status” or a “comfortable life.” Traditional measures of success prestige, lifestyle seem to matter less to this group than the intrinsic satisfaction of caring for others.

For educators, this is both reassuring and instructive. It suggests that most students are starting their training with values that align with the best traditions of the profession. But it also places a responsibility on medical schools: to nurture, rather than erode, this sense of purpose. A curriculum that keeps patient-centered care at its core through early clinical exposure, role models who emphasize empathy, and space to reflect on the human side of medicine can help sustain these motivations.

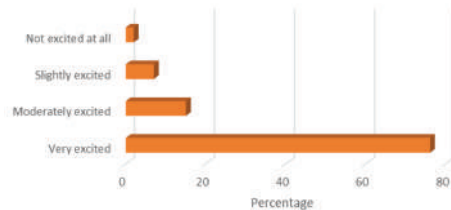


*Figure 5.9: Rate your level of excitement towards beginning your journey in the medical field*

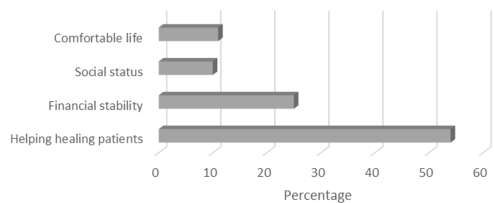


*Figure 5.10: What do you anticipate as the most rewarding aspect of being a medical professional?*

The data shows that students aren't just chasing titles or paychecks. At least at this stage, they are looking for meaning in their work. Medical education that strengthens that drive could play a big role in producing not just competent doctors, but compassionate ones.

Figure 11 highlights the mix of reasons that push students toward medicine, and the diversity is striking. Nearly half of the respondents (48%) said their primary motivation was to serve their community a clear sign that altruism and social impact still play a central role in how many young people imagine the profession.

At the same time, about a quarter (23%) were drawn by the intellectual challenge. For these students, medicine seems less about status or security and more about curiosity about the puzzles of the human body, the complexity of disease, and the satisfaction of problem-solving.

Financial motives were present but secondary. Roughly 22% admitted that stability and income factored into their choice, while only a small group (7%) envisioned themselves primarily through the lens of research. The relatively low percentage for research may suggest either a lack of exposure to this career path at the school level or a perception that research is less rewarding compared to direct patient care.

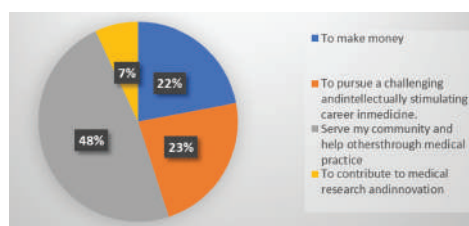
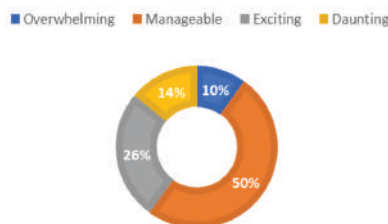


Figure 5.11: What is your primary aim to join the MBBS program

These findings remind us that motivations are rarely uniform. They blend personal passion, practical considerations, and social ideals. For educators, the challenge is to design programs that speak to all of these drivers supporting the altruists who want to serve, stimulating the intellectually curious, and offering pathways for those who might later discover a love for research. Recognizing this variety early on could help medical education nurture doctors who are not only competent but also fulfilled in the direction they choose to take.

Figure 12 gives a window into how first-year MBBS students size up the difficulties of medicine. Half of the respondents (50%) said the challenges felt "manageable," which suggests a certain resilience and confidence at the outset. Another quarter (26%) went further, describing the career as "exciting" a reminder that, for some, the hurdles are seen less as obstacles and more as opportunities to grow.



Still, not all students view the road ahead with such optimism. About 10% found the challenges "overwhelming," while 14% described them as "daunting." These smaller groups matter: their voices point to anxieties that could, if left unaddressed, erode motivation over time.

The mix of responses highlights a key point for educators. Most students don't necessarily need protection from difficulty they expect hard work

Figure 5.12: How do you perceive the challenges associated with a career in medicine?

and even thrive on it but a subset clearly needs more structured support. Mentorship, stress-management workshops, or even small curricular adjustments could make the difference between resilience and burnout.

Perceptions of challenge are not uniform. Some students see the path as tough but doable, others as thrilling, and a few as frightening. Recognizing and responding to this diversity early on could help schools and colleges foster a healthier, more supportive environment for all future doctors.

Figure 13 sheds light on the worries first-year MBBS students carry with them as they enter the profession. Nearly half (48%) voiced concern about work–life balance and the risk of burnout a striking reminder that even at the very start of their training, students are already imagining the long hours and relentless pace that medicine is known for.

Financial stress was another major theme, with 29% pointing to the cost of medical education and the weight of debt as a source of anxiety. For many families, securing an MBBS seat involves heavy financial sacrifice, and students are acutely aware of the pressure this creates.

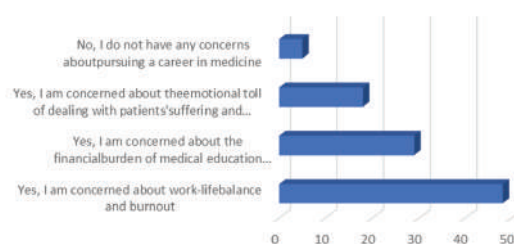


Figure 5.13: Do you have any concerns about pursuing a career in medicine?

A smaller but still important group (18%) worried about the emotional burden of dealing with suffering patients and difficult cases. This points to an often-overlooked reality: the profession doesn't only test academic skill or endurance but also emotional resilience.

Taken together, these concerns paint a picture of students who are motivated but far from carefree. They know medicine is demanding, and they already sense the personal, financial, and emotional trade-offs it will require. For educators, the challenge lies in building support systems that acknowledge these realities whether through wellness programs, financial counselling, or structured opportunities to reflect on the emotional side of care. Addressing these concerns early on could help prevent them from becoming long-term sources of distress.

Figure 14 highlights some of the myths and misplaced expectations that first-year MBBS students bring with them. A large share 42% believed that getting through medical school would be relatively easy, a misconception that risks colliding head-on with the reality of long hours, dense coursework, and unrelenting exams.

Another 35% pictured medicine as a “glamorous” profession, perhaps shaped by popular media or societal narratives that spotlight prestige more than day-to-day grind. Interestingly, only 17% associated the career primarily with high income, suggesting that while financial motives are present, they don't dominate students' imaginations. At the very bottom, just 6% framed medicine in terms of constantly “saving lives” the dramatic but somewhat unrealistic image often tied to the field.

These numbers show that many students step into medical school with ideas that don't quite line up with the realities of the profession. If left unchallenged, such misconceptions could lead to disappointment, frustration, or even disillusionment. For educators, the task is to gently but firmly correct these views early on through honest discussions, early exposure to clinical settings, and mentorship that portrays both the rewards and the demands of medicine.

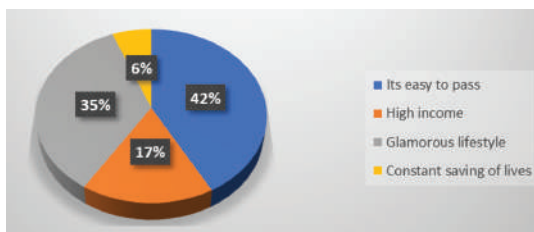


Figure 5.14: What do you believe are common misconceptions about the medical profession?

Enthusiasm is important, but without a grounded understanding, it risks becoming fragile. Helping students replace myths with more balanced expectations may be one of the most valuable lessons in their first year.

Figure 15 captures how first-year MBBS students view their own preparedness for the responsibilities of being a doctor. Most (60%) said they felt at least moderately confident, which suggests a baseline sense of readiness. But the picture becomes more mixed when we look closer: about one in five students (21%) admitted they were only “somewhat” confident, 5% felt not confident at all, and just 4% described themselves as fully confident.

What this distribution reveals is a spectrum students don't arrive at medical school equally sure of themselves. Some step in with a stronger sense of what the profession demands, perhaps thanks to better schooling, exposure to healthcare environments, or family background. Others seem less certain, which may reflect gaps in how school curricula connect science learning with real-world professional roles.

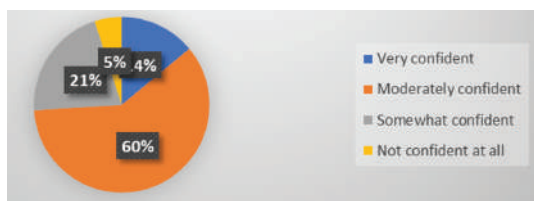


Figure 5.15: How confident do you feel about your understanding of the responsibilities and duties of a medical professional?

For educators, this matters. If medical training assumes all students begin on the same footing, those with lower confidence may slip through the cracks. Early interventions structured orientation programs, mentoring, or practical skill-building modules could help balance the field, ensuring that students not only gain knowledge but also trust in their ability to shoulder responsibility.

These findings remind us that confidence is not evenly distributed at the starting line. Strengthening the bridge between school-level education and the expectations of medical training could go a long way in preparing students to grow into capable and self-assured professionals.

Figure 16 points to a surprising trend: more than half of the first-year MBBS students surveyed (58%) admitted they did not attend their 12th-grade classes regularly. On the surface, this might look like simple absenteeism, but it likely reflects deeper tensions in how students prepare for NEET.

Many students juggle competing priorities regular school classes on one hand and intensive coaching on the other. For some, coaching becomes the clear priority, leading them to skip school lectures they see as repetitive or less exam-focused. Others may have faced personal or environmental factors long commutes, family responsibilities, or stress that made consistent attendance difficult.

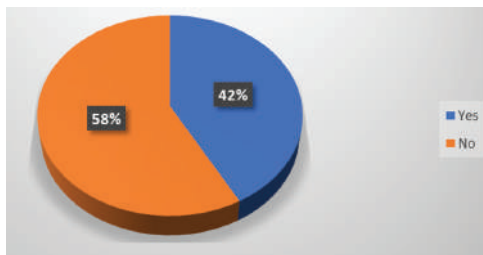


Figure 5.16: Did you attend your regular school in Class 12 to the fullest

This gap raises an important question: if so many students felt they could afford to skip school during such a crucial year, what does it say about the alignment between classroom teaching and NEET preparation? For schools, the challenge is to make classroom learning not only relevant but essential, so students see value in showing up.

Improving this alignment could do more than boost exam readiness. It might also strengthen the academic foundation and discipline that students carry into medical school, ultimately shaping both their competence and their professionalism.

Figure 17 reveals a striking gap between what schools provide and what students feel they need for NEET. Out of 80 respondents, only 21 said their Class 12 schooling had meaningfully helped them prepare, while the vast majority (79%) felt it had little to no impact. That kind of imbalance raises tough questions about the role of school education in a system so heavily dominated by entrance coaching.

Students' perceptions here may point to a misalignment: while school curricula focus on broader subject learning, NEET preparation often zeroes in on speed, problem-solving, and exam-specific strategy. For many, this mismatch likely fuels the reliance on private coaching and reduces confidence in the value of regular classroom teaching.

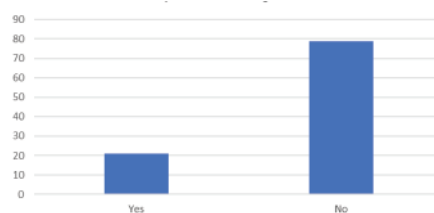


Figure 5.17: Did you school teaching in Class 12 more helpful in clearing NEET

This divide has serious implications. If students consistently see school as secondary to coaching, it undermines the credibility of formal education and widens inequities since not every family can afford extensive external preparation.

To bridge this gap, schools may need to adapt by integrating more exam-oriented practice, offering guidance on test strategy, and connecting core curriculum content more explicitly to competitive exams. At the same time, it's worth asking whether the system itself has tilted too far toward "coaching culture" at the expense of deep, conceptual learning.

Students' responses in Figure 17 are not just about personal perception; they're a signal that high school education risks being sidelined in the medical entrance race. Addressing that perception is essential if schools are to remain meaningful players in shaping future doctors.

Looking at Fig. 18, it's striking to see what it tells us about the grit of first-year MBBS students. Out of 80 students, 61 that's 83% didn't make it into medical school on their first try and had to take the NEET exam at least once more to get in. That number really drives home how tough the competition is for those coveted seats. It makes you wonder if high schools could do more to guide students through this process, especially in that nerve-racking first attempt. I mean, preparing for an exam like NEET is no small feat think endless late nights, piles of study guides, and the pressure of knowing one test could shape your entire future.

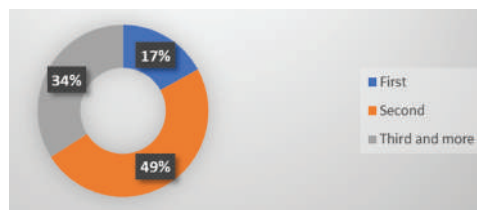


Figure 5.18: In which attempt could you crack NEET and got admission in MBBS

The fact that so many students only got in after multiple tries also says something about perseverance. It's not just about being book-smart; it's about picking yourself up after a setback and trying again, maybe even a few times. But here's another angle: while this resilience is inspiring, it also raises questions about whether the system is too grueling. Should it really take multiple attempts for so many capable students to break through? Maybe schools could step up with better prep programs think targeted coaching or mock exams rather than leaving students to navigate this high-stakes process mostly on their own. After all, a solid high school education should lay the groundwork for tackling challenges like NEET, not just academically but mentally too.

When I dug into what first-year MBBS students had to say about their backup plans if they hadn't cracked NEET, I was struck by how varied their answers were. Some were set on staying close to medicine like pursuing biotech or going for BAMS or BHMS degrees while others were ready to pivot entirely, imagining themselves in fields as different as joining the army, designing clothes, or starting a business. A few even mentioned research or tackling the UPSC exams. It's fascinating to see this mix of determination to stick with medicine despite the odds and openness to completely different paths. It got me thinking: are schools doing enough to help students explore these diverse interests? Career counseling could really make a difference here, giving kids a clearer sense of what's out there beyond the NEET grind.

Sifting through their open-ended responses, a few patterns jumped out. Many of these students seem driven by a genuine desire to help people there's this almost old-school, idealistic view of medicine as a calling, which feels very rooted in how India sees doctors. It's heartwarming, honestly, to hear them talk about wanting to make a real difference. But it's not all rosy. They're also upfront about their worries medicine's no walk in the park. The relentless studying, long hours, and emotional weight of caring for patients clearly weigh on them. Some even admitted to having slightly off-base ideas about what being a doctor is like, expecting a cushy lifestyle or big paychecks that don't always materialize. This mix of high ideals and real concerns makes me think schools and colleges need to step up with better mentorship maybe real talk from practicing doctors to help students see the full picture. It's clear these aspiring doctors are navigating a lot of hopes, fears, and misconceptions, and that's something the education system should address to help shape their path forward.

## **Vocational Education**

Reading through the details on vocational education under India's NSQF, it's clear the system is trying to give students a practical leg up in fields like healthcare, starting as early as Class 9. At its core, it's about equipping kids with real-world skills that can land them jobs or set them up for further studies. For example, at NSQF Level 3, students get their feet wet with roles like General Duty Assistant (GDA) or Home Health Aide, learning the basics think patient care essentials and keeping things clean and hygienic. It's the kind of hands-on stuff that sounds simple but is critical in any hospital or clinic. By Level 4, things step up a bit. Students start picking up skills like checking vital signs, controlling infections, or even helping with basic physiotherapy. It's not just following instructions anymore; they're starting to understand how things work in a healthcare setting. They are assisting nurses, handling basic medical equipment, while Home Health Aides take on bigger responsibilities like caring for patients with chronic conditions or coordinating with healthcare teams. By the time they hit higher Level, these students are doing things like giving medications under supervision, keeping detailed patient records, or drafting care plans, which feels like a big leap from where they started.

What caught my eye, though, are the newer roles like Yoga Therapy Assistant and Telehealth Services Coordinator. The Yoga Therapy Assistant gig, tied to AYUSH initiatives, is interesting it's about helping patients use yoga for rehab or managing chronic illnesses, which shows how traditional practices are finding a place in modern healthcare. Meanwhile, Telehealth Coordinators are stepping into a digital world, setting up virtual doctor visits, managing online health records, and keeping patient data secure. With telehealth booming, that role feels especially relevant, though I wonder if schools are fully equipped to teach the tech side of it.

The mix of theory, hands-on practice, and real-world training through on-the-job stints seems like a solid approach. Getting certified by sector skill councils also gives students a clear path to jobs or more specialized studies after Class 12. Still, I can't help but wonder if enough students know about these options early on or if schools are promoting them as seriously as, say, engineering or medical entrance exams. It feels like vocational education could be a game-changer for a lot of kids, but only if it's presented as a real, respected path, not a fallback.

## **Implications for Quality School Education**

Preparing students for high-stakes exams like NEET in India is no small task, and it's clear that schools need to do more than just drill academics into kids' heads. Quality education isn't just about hitting the NEET syllabus it's about sparking curiosity, sharpening critical thinking, and helping students actually understand the material, not just memorize it. Schools could make a real difference by offering things like regular practice tests, one-on-one counseling, or even clubs and activities that let kids unwind and find balance. I've seen how the pressure to succeed can weigh on students, especially in places like Kota, where the coaching culture can feel like a pressure cooker. It's worth asking: are we pushing kids too hard toward external coaching when schools could step up instead?

The NCFSE 2023 framework brings an interesting angle by weaving vocational training into the mix, emphasizing three forms of work that doctors encounter: life form (working

directly with patients' bodies), machine and material form (using tools like stethoscopes or medicines), and service form (providing care as a core profession). This approach makes sense it shows students the many sides of healthcare work early on. But here's the thing: not every kid dreaming of medicine needs to become a doctor. Schools could broaden horizons by introducing health-related vocational courses, like General Duty Assistant or Yoga Therapy Assistant, which align with NSQF frameworks. These programs teach practical skills like taking vitals or supporting rehab through yoga that can lead to jobs or even give students an edge in NEET by grounding their studies in real-world applications.

I think there's also a bigger cultural shift needed. Teachers, parents, and peers often unintentionally funnel kids toward medicine as the ultimate goal, but what if we celebrated other paths just as much? Imagine schools hosting career fairs where a Telehealth Coordinator or an Emergency Medical Technician gets the same spotlight as an MBBS doctor. Parental awareness programs could help here, encouraging moms and dads to cheer on their kids' unique talents instead of chasing society's idea of success. I remember a friend in school who was pushed toward medicine but ended up thriving as a physiotherapist her parents just needed a nudge to see that as a win.

On the flip side, schools have to rethink how they teach and test. NEET demands more than rote learning now; it's about applying knowledge. Curriculums should reflect that, focusing on problem-solving over cramming. Vocational courses could also ease the pressure by giving students practical skills and a clearer picture of healthcare careers early on. A kid who's tried their hand at being a Home Health Aide might realize they love patient care or that it's not for them before betting everything on NEET. By blending these practical programs into high school, we're not just prepping students for exams but setting them up for careers that match their strengths. It's about creating a system that values well-rounded, resilient individuals who feel empowered to follow their own paths, not just the one society's laid out for them.

## **Conclusion**

This study paints a vivid picture of first-year MBBS students' complex views on medicine a mix of enthusiasm, altruism, and some misconceptions about the job's demands. Many students are driven by a desire to help others, which feels true to medicine's core. Yet, some overestimate the glamour or financial perks, underestimating the gruelling hours and emotional toll. I remember a friend who started med school with big dreams but was blindsided by the stress. Early interventions like mentorship or orientation programs could help set realistic expectations.

Quality school education is key, not just for nailing NEET but for building critical thinking and resilience. The NEP 2020 and NCFSE 2023 push for vocational training, which could be a game-changer. Picture high schoolers trying roles like General Duty Assistant or Telehealth Coordinator gaining hands-on skills that ground their aspirations or reveal other paths. These programs, blending theory and practice, can prepare students for healthcare careers or NEET itself while reducing reliance on stressful coaching centres like those in Kota.

Schools also need to shift the narrative that medicine is the only "worthy" path. Counselling and parental awareness can encourage kids to explore diverse careers without societal

pressure. By weaving in vocational skills, emotional preparedness, and ethical grounding, schools can produce doctors who are not just academically sharp but also empathetic and ready for real-world challenges, bridging the gap between dreams and the realities of healthcare.

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## Voices of the Future: Analysing Vocational Interests in Secondary Education

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### Abstract

The National Education Policy-2020, the first educational reform of the 21st century, emphasizes the need of vocational education. Vocational training is important for the progress of any nation, and NEP 2020 identifies the secondary level as the stage where it becomes an essential component of education. This approach allows students to explore areas of personal interest and acquire the skills necessary for a successful life. In this study, the differences in vocational interests among students of Uttar Pradesh's UP Board Class 11th have been examined based on the school type (private and government) and the gender of the students. As a sample 200 students were selected, and data were gathered using the Vocational Interest Record constructed by Dr. S.P. Kulshreshtha. For statistical analysis, the researcher employed the mean, median, standard deviation, and t-test. The findings indicated that students, whether from private or government schools, show considerable interest in certain vocational fields while displaying significantly less interest in others. Additionally, the study revealed no significant difference in vocational interests between girls and boys. The outcomes of this study will assist teachers, counsellor and administration in guiding vocational programs for students.

**Keywords:** Vocational Education, Vocational Interest, Secondary students of U.P. board

### Introduction:

From the moment a person is born, they start adapting to their environment. This adaptation leads to the progress of their natural abilities, and the formal and informal enhancement of these abilities is what constitutes education. Education is essential for producing skilled workers, which is important for a nation's development. A student's career choices are central, as an individual's standard of living is often determined by their profession. In 1976, NCERT introduced a document called "Higher Secondary Education and Its Vocationalization," which provided a model for implementing vocational education nationwide. However, by 1986, only 2.5% of students were enrolled in vocational education programs. The New Education Policy 2020 highlights that vocational education is as important as general education. To meet the goals of vocational education, students must have a thorough understanding of their career fields and interests. The 12th Five-Year Plan

(2012-2017), a minimal (%) of the Indian workforce aged 19-24 less than 5% has received formal vocational education. In contrast, vocational education rates are much higher in other countries: 52% in the USA, 75% in Germany, and 96% in South Korea. This disparity highlights the critical need to accelerate the expansion of vocational education in India.

### Chart:

| Country     | % of “the Individuals who have received formal vocational education” |
|-------------|----------------------------------------------------------------------|
| India       | < 5%                                                                 |
| USA         | 52%                                                                  |
| Germany     | 75%                                                                  |
| South Korea | 96%                                                                  |

*Source: NEP 2020*

This chart visually represents the vocational education rates across the different countries, illustrating the significant gap between India and the other nations. Recognizing its significance, the New Education Policy suggests incorporating vocational education into mainstream education. Despite significant efforts and widespread promotion of education, unemployment remains a persistent issue in India. A major reason for this is the lack of vocational guidance for students throughout their years of education. Lacking adequate knowledge about different career options, students frequently struggle to select vocational paths that match their interests, restricting their prospects for future success.

### Vocational Interest:

Vocational interest refers to an individual's preference in a specific area of expertise, shaped by their abilities or personal inclinations. According to Holland (1977), “it represents an aspect of a person's personality, manifested through their choices in work, academic subjects, or leisure activities”. Vocational interests provide the motivation people need to steer their lives towards success. Without a vocation, a person becomes reliant on others that may restrict them from experiencing true satisfaction or peace in life. Therefore, having a vocation is crucial for everyone. To choose the right vocation, it's essential for individuals to understand their own vocational interests (Vocational/Work Education). The NCERT, aligning with the goals of the National Education Policy 2020 for vocational education, has introduced the KAUSHAL BODH, an activity book for grade 6. In the NCF-SE 2023 (National Curriculum Framework for School Education), work is classified into three key areas: life forms, machines and materials, and human service. To support these goals and learning outcomes, the book offers a diverse range of activities in vocational field. It helps student's develop foundational skills; gain an understanding of the significance of

vocational skills and essential work values. Also, the book furnishes the students with core skills and related knowledge of various fields that will be contributes to household and livelihood tasks in future. This initiative shows the growing need in India for awareness, structured curriculum, activity textbooks and guidance in vocational education (NCERT, 2024).

The secondary level of education is an important phase in which students can start to explore and select vocational subjects based on their interests, allowing them to acquire new skills. As stated by the New Education Policy 2020, by 2025, the objective is to offer vocational education to 50% of students through both the school system and higher education systems. Clear targets and deadlines will be established to ensure this goal is met. To facilitate this, the MHRD (Ministry of Human Resource Development) will form a ‘National Committee for the Integration of Vocational Education’, consisting of vocational education experts and representatives from vocational ministries, to focus on key areas of vocational training. By 2030, all institutions offering either vocational or general education will aim to integrate both types of education within their curricula. To accomplish this goal, secondary-students must gain a deeper awareness reflecting their personal interest. This study focuses on analysing the vocational interests of 11th grade students in Uttar Pradesh, considering of school type (private and government) and students’ gender. Present study can serve to development of and improve educational materials that better support students in making informed vocational choices.

**Review of related literature:** Here, the review of related literature is presented in two tabular forms: the first table includes previous studies on vocational education, while the second table presents relevant policies and official reports related to vocational education.

**Table: Review of Related Studies on Vocational Interests**

| Author<br>(Publication<br>Year)             | Title / Objective                                                    | Sample                                           | Key Findings / Results                                                                  |
|---------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Yadav, K.<br/>(2011)</b>                 | Vocational interests among SC/ST students                            | Higher secondary SC/ST students, Baitul district | ST students preferred literature; SC students preferred science and home-related fields |
| <b>Sharma, N.<br/>(2013)</b>                | Influence of gender and residential location on vocational interests | 200 high school students, Bilaspur & Pathankot   | Gender and residential location influenced vocational interests                         |
| <b>Vyas, Y.<br/>(2016)</b>                  | Vocational interests in government vs private schools                | 500 senior secondary students, Delhi             | Government school students had higher inclination toward vocational courses             |
| <b>Kumar, P.<br/>(2016)</b>                 | Interest in vocational courses based on gender & residence           | 100 Class X students, Fatehgarh Sahib            | 57% showed high interest; significant differences based on gender and residence         |
| <b>Tripathi &amp; Srivastava<br/>(2017)</b> | Vocational interest comparison CBSE vs UP board                      | 200 Class X students                             | No significant gender differences between boards                                        |

|                                           |                                                            |                                     |                                                                                    |
|-------------------------------------------|------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------|
| <b>Chauhan &amp; Chocha (2017)</b>        | Gender differences in vocational preferences               | 70 Class X & XII students           | Boys preferred agriculture; girls preferred arts                                   |
| <b>Modal &amp; Mazumdar (2018)</b>        | Gender-based vocational interests                          | 200 secondary students, Murshidabad | Girls: artistic, domestic, social fields; Boys: agriculture, executive, literature |
| <b>Shraddha &amp; Khandwala (2022)</b>    | Vocational interest by gender                              | 120 Class IX students               | Males showed higher interest in enterprising fields                                |
| <b>Kartik, Acharya &amp; Kumar (2023)</b> | Vocational interest, gender & socio-economic status        | 300 secondary students              | Rural-urban differences significant; no gender differences                         |
| <b>Sud et al. (2024)</b>                  | Vocational interests & aspiration levels                   | 100 secondary students              | Boys had significantly higher vocational interest and aspiration                   |
| <b>Ali &amp; Khan (2024)</b>              | Vocational interests in West Bengal                        | 348 students                        | Females and private school students recorded higher vocational interest            |
| <b>Singh &amp; Saroy (2025)</b>           | Vocational interest & intelligence correlation             | Secondary students, Patiala         | Positive relationship between vocational interest & intelligence                   |
| <b>Bahuguna &amp; Sharma (2025)</b>       | Vocational & educational interests vs academic achievement | 500 secondary students, Delhi       | Positive correlation between vocational interest and academic performance          |

Table 6.1: Review of Related Studies on Vocational Interests

## Table: Review of Vocational Education Policies and Programmes

| Policy / Programme / Report                        | Objective                                               | Target / Coverage                          | Key Features / Impact                                                                                                                                                                           |
|----------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Samagra Shiksha-Vocational Education</b>        | Promote NSQF-aligned vocational courses                 | Secondary schools (Class IX+) across India | Provides vocational subjects, industry linkages, NSQF certification                                                                                                                             |
| <b>Kaushal Bodh (NCERT)</b>                        | Develop practical, real-life skills                     | Class 8 students nationwide                | Emphasises hands-on, competency-based learning and skill preparation                                                                                                                            |
| <b>National Education Policy (NEP) 2020</b>        | Integrate vocational education across school levels     | All school stages                          | Vocational exposure starting Class 6, flexibility in pathways                                                                                                                                   |
| <b>NCF-SE 2023</b>                                 | Strengthen experiential & competency learning           | Secondary education nationwide             | Supports vocational pathways and real-life skills within curriculum                                                                                                                             |
| <b>ASER 2023 Report-Vocational Engagement Data</b> | Assess rural youth participation in vocational training | Rural youth aged 14-18 across India        | Only <b>5.6% of surveyed youth</b> engaged in vocational training or related courses, revealing low uptake of skills/ vocational education among older adolescents ( <i>ASER Centre, 2023</i> ) |

Table 6.2: Review of Vocational Education Policies and Programmes

**Research gap:** The analysis of existing studies reveals that prior research on students' professional interests has produced varying results concerning gender differences. However, there appears to be considerable gap in the reviews concerning the school type, particularly government and private schools, on these interests. Thus, this study seeks to address this gap by including both gender and school type as variables in assessing students' vocational interests.

## **Problem Statement:**

**Voices of the Future:** Analysing Vocational Interests in Secondary Education

## **Objectives:**

1. To study the vocational interests of secondary level students in relation to the type of schools (private and government schools).
2. To study the vocational interests of secondary level students with respect to their gender.

## **Hypotheses:**

**H01:** There is no significant difference in the vocational interests of secondary level students with respect to type of schools (private and government schools).

**H02:** There is no significant difference in the vocational interests of secondary level students with respect to their gender.

## **Delimitation:**

This study is limited to studying students of class 11th in the Board of 'High School and Intermediate Education' of Uttar Pradesh.

## **Methodology:**

This study is grounded in data gathered from a primary survey. To achieve the study's objectives, the survey method of descriptive research has been chosen by the researcher.

## **Sample Size:**

The overall number of students studying in Class 11th in Varanasi under the U.P. Board was considered as population for this study. Using the lottery method of random sampling, four schools (two governments and two private) were selected for the sample. Total 200 students were chosen for the study. The sample consisted of 100 students from private schools and 100 students from government schools. From the private schools, 50 male and 50 female students were chosen, while the same gender distribution was used to 100 students' selection from government schools by cluster sampling method.

## **Sampling method:**

| <b>Method</b>                    | <b>Place of use</b>    |
|----------------------------------|------------------------|
| Lottery method (by use of chits) | Selection of schools   |
| Cluster random sampling method   | Selections of students |

## **Variables:**

**Independent variable:** Type of school of U.P. Board (private and government schools) and gender of class 11th students

**Dependent variable:** Vocational interest

## **Data Collection Tool:**

In this study, Dr. S.P. Kulshrestha's Vocational Interest Record was used to examine the vocational interests of Class 11th students from the U.P. Board. The Vocational Interest Record is published by the National Psychological Corporation in Agra. This record comprises 10 different vocational fields: literary, scientific, executive, commercial, creative, agricultural, persuasive, social, and households, with each field consisting of 20 specific professions. Thus, the inventory includes a total of 200 professions associated with various vocational interests. The test is both reliable and valid, with a test-retest reliability score of 0.69 and a validity score of 0.89.

**Scoring:** Maximum attainable score under each vocational interest area is 20 and the minimum score is 0. One mark is assigned for each correct mark (✓).

## **Statistical Technique:**

Mean, standard deviation and t-test were employed to analyse the data.

## **Analysis and Interpretation of the study:**

**A. Hypothesis 1:** There is no significant difference in the vocational interests of secondary level students with respect to type of schools (private and government schools). The result related to hypothesis 1 is given as follows.

| Vocational Field | Group Division | Number of Students | Mean  | Mean deviation | t- value |
|------------------|----------------|--------------------|-------|----------------|----------|
| L                | Gov. School    | 100                | 10.85 | 2.6            | 0.82     |
|                  | Pvt. School    | 100                | 10.77 | 2.6            |          |
| SC               | Gov. School    | 100                | 11.42 | 2.25           | 0.57     |
|                  | Pvt. School    | 100                | 11.61 | 2.83           |          |
| E                | Gov. School    | 100                | 11.71 | 2.52           | 0.84     |
|                  | Pvt. School    | 100                | 11.79 | 3.06           |          |
| C                | Gov. School    | 100                | 8.35  | 2.3            | 0.88     |
|                  | Pvt. School    | 100                | 8.29  | 3.41           |          |
| CO               | Gov. School    | 100                | 8.98  | 3.03           | 0.83     |
|                  | Pvt. School    | 100                | 8.88  | 3.75           |          |
| A                | Gov. School    | 100                | 10.69 | 1.8            | 0.81     |
|                  | Pvt. School    | 100                | 10.76 | 2.28           |          |
| AG               | Gov. School    | 100                | 9.91  | 2.14           | 0.92     |
|                  | Pvt. School    | 100                | 9.74  | 2.17           |          |
| P                | Gov. School    | 100                | 10.4  | 2.27           | 0.86     |
|                  | Pvt. School    | 100                | 10.34 | 2.7            |          |
| S                | Gov. School    | 100                | 10.71 | 2.51           | 0.63     |
|                  | Pvt. School    | 100                | 10.54 | 2.44           |          |
| H                | Gov. School    | 100                | 10.74 | 2.47           | 0.78     |
|                  | Pvt. School    | 100                | 10.64 | 2.67           |          |

L=Literary, S=Scientific, E=Executive, C=Commercial, CO=Constructive, A=Artistic, Ag=Agricultural, P=Persuasive, S=Social, H=Households

*Table 6.3: Comparative attitudes of private school and government school students towards Vocational interests*

**Significance:** All T-scores across the different fields are below the threshold for significance at the 0.05 level. This signifies there are no statistically significant differences between the vocational interests of students from private and government schools in any of the fields measured.

## Mean Scores Comparison:

**1.Literary Field:** The T-score of 1.82 is not significant, with government school students (10.85) having a slightly higher mean than students of private school (10.77).

**2.Scientific Field:** The T-score of 0.57 shows no significant difference, with private school students (11.61) having a higher mean than government school students (11.2).

**3.Executive Field:** With a T-score of 0.84, there are no significant differences, with private school students (11.79) having a slightly higher mean than government school students (11.71).

**4.Commercial Field:** The T-score of 0.8 indicates no significant difference, with government school students (8.35) having a marginally higher mean than students of private school (8.029).

**5.Constructive Field:** The T-score of 1.83 shows no significant difference, with government school students (8.98) having a slightly higher mean than students of private school (8.88).

**6.Artistic Field:** The T-score of 0.81 is not significant, with private school students (10.76) having a slightly higher mean than government school students (10.69).

**7.Agricultural Field:** The T-score of 0.92 is not significant, with private school students (9.74) having a higher mean than government school students (9.1).

**8.Persuasive Field:** The T-score of 1.86 shows no significant difference, with private school students (10.34) having a slightly higher mean than government school students (10.04).

**9.Social Field:** The T-score of 0.63 indicates no significant difference, with government school students (10.71) having a slightly higher mean than students of private school (10.54).

**10.Household Field:** The T-score of 1.78 is not significant, with the mean of government school students (10.74) being higher mean than that of private school students (10.64).

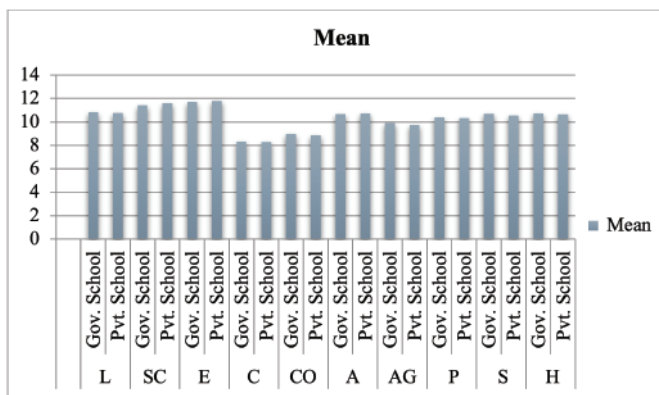


Figure 6.1: Comparison of Vocational Interest of private and government school students of U.P. Board (Mean Value) N=200s

The graph clearly indicates that, based on the median calculated from the number of students in both government private and schools, government school's students tend to show more interest in fields such as literature, commerce, constructive, artistic, agriculture, social work, and household's activities. In contrast, students of private schools are more disposed towards scientific, executive, and persuasive fields compared to their government school counterparts.

**B. Hypothesis 2:** There is no significant difference in the vocational interests of secondary level students with respect to their gender.

The result related to hypothesis 2 is given as follows.

| Vocational Field | Group Division | Number of Students | Mean  | Mean Deviation | t-value |
|------------------|----------------|--------------------|-------|----------------|---------|
| L                | Boys           | 100                | 9.37  | 3.65           | 0.51    |
|                  | Girls          | 100                | 9.03  | 3.59           |         |
| SC               | Boys           | 100                | 10.14 | 3.01           | 0.52    |
|                  | Girls          | 100                | 9.86  | 2.84           |         |
| E                | Boys           | 100                | 10.77 | 2.94           | 0.08    |
|                  | Girls          | 100                | 10.02 | 3.16           |         |
| C                | Boys           | 100                | 8.7   | 3.13           | 0.25    |
|                  | Girls          | 100                | 8.19  | 3.13           |         |
| CO               | Boys           | 100                | 8.38  | 3.42           | 0.44    |
|                  | Girls          | 100                | 7.98  | 3.92           |         |
| A                | Boys           | 100                | 10.07 | 2.75           | 0.69    |
|                  | Girls          | 100                | 10.21 | 2.17           |         |
| AG               | Boys           | 100                | 9.76  | 4.11           | 0.18    |
|                  | Girls          | 100                | 10.43 | 2.83           |         |
| P                | Boys           | 100                | 9.47  | 2.27           | 0.62    |
|                  | Girls          | 100                | 9.29  | 2.92           |         |
| SC               | Boys           | 100                | 10.25 | 2.74           | 0.36    |
|                  | Girls          | 100                | 10.61 | 2.78           |         |
| H                | Boys           | 100                | 10.31 | 2.91           | 0.22    |
|                  | Girls          | 100                | 10.81 | 2.81           |         |

L=Literary, S=Scientific, E=Executive, C=Commercial, CO=Constructive, A=Artistic, Ag=Agricultural, P=Persuasive, S=Social, H=Households

*Table 6.4: Comparative study of vocational interests among all students of private and government schools*

**Significance:** The T-scores for all the different fields fall below the 0.05 level of statistical significance. This implies there are no statistically significant differences between the vocational interests of female and male students across all the fields assessed.

### Mean Scores Comparison:

**1.Literary Field:** The T-score of 0.51 shows no significant gender differences, with males scoring slightly higher median scores (9.37) than females (9.03).

**2.Scientific Field:** With a T-score of 0.952, there are no significant gender differences; males have a higher median score (10.5) compared to females (9.86).

**3.Executive Field:** The T-score of 0.08 indicates no significant, with males increased median score (10.7) than females (10.02).

**4.Commercial Field:** The T-score of 1.25 is not significant, with females (8.19) attaining a higher median score in comparison to males (8.07).

**5.Constructive Field:** A T-score of 1.44 shows no significant differences, with males (8.38) scoring higher medians than females (7.98).

**6.Artistic Field:** The T-score of 0.69 suggests no significant difference, with females (10.21) holding an improved median score than males (10.07).

**7.Agricultural Field:** With a T-score of 0.18, there are no significant gender differences; females have a greater median score (10.43) compared to males (9.76).

**8.Persuasive Field:** The T-score of 0.62 indicates no significant difference, with males (9.47) obtaining a higher median score relative to females (9.29).

**9.Social Field:** The T-score of 1.36 shows no significant gender differences, with females (10.61) featuring an elevated median score compared to males (10.5).

**10.Household Field:** The T-score of 0.22 is not significant, with females (10.81) showcasing a higher median score compared to males (10.31).

## Graph:

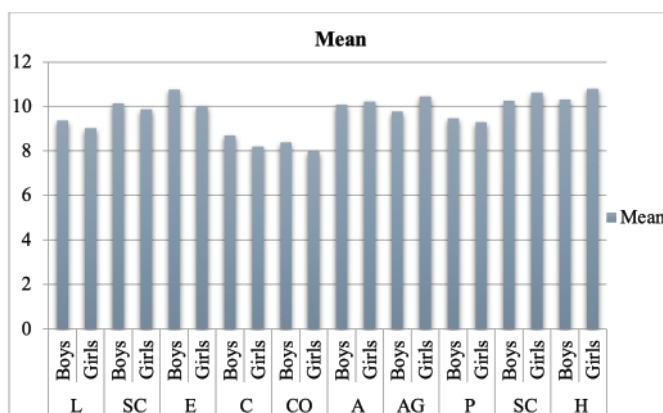


Figure 6.2: Comparison of Vocational Interest of girls and boys students of U.P. Board school (Mean Value) N=200

The graph indicates that, the median values derived from gender-based calculations for students in both private and government schools, male students are more interested towards literary, scientific, executive, persuasive, social, and household fields. In contrast, female students exhibit a higher interest in constructive and agricultural sectors compared to their male counterparts.

## Conclusion & Educational Implications:

The present study examined vocational interests among secondary school students in government and private schools and across gender, revealing no statistically significant differences in overall vocational preferences. This finding suggests that secondary students' career interests are increasingly shaped by broad educational exposure and evolving socio-educational awareness rather than by school type and gender alone. Although descriptive trends showed variations in specific vocational domains, these did not translate into statistically meaningful disparities. These results carry significant practical implications for educators and policymakers.

For teachers, the findings reinforce the need to integrate vocational awareness through experiential learning and interdisciplinary methods, consistent with the National Curriculum Framework for School Education (NCF-SE) 2023, which emphasizes competencies,

real-life application, and career exploration education. For school counsellors, the results present the importance of interest-based and stereotype-free guidance, helping students make informed decisions aligned with personal strengths and emerging opportunities. Practically, this can be implemented through classroom strategies through the project-based learning, career-linked assignments, field visits, and short-term vocational modules. It will allow students to explore real-world applications of academic concepts. Teachers can also use structured reflection activities and interest inventories during regular classroom interactions to help students connect learning experiences with potential career pathways.

Importantly, situating this research within the U.P. Board context adds practical value rather than detracting from general relevance. The U.P. Board represents one of the largest and most diverse state education systems in India, encompassing students from varied rural, semi-urban, and urban backgrounds. As such, it offers a realistic and representative setting for examining vocational interests within mainstream public schooling. According to official data from the Uttar Pradesh Secondary Education Department, vocational education schemes are operational in 892 government and government-aided secondary schools across the state, and officials are actively encouraging increased student participation in these courses (UNIFIED DISTRICT INFORMATION SYSTEM FOR EDUCATION, 2020–21; UDISE Plus, 2025). Although enrolments in vocational subjects have historically been low, these efforts reflect a broader policy emphasis on skill development and employability in one of India's largest school systems. This context provides a meaningful empirical foundation for understanding how vocational interests manifest at scale in real school environments where implementation challenges and opportunities coexist.

At the policy level, the study aligns with initiatives such as 'Kaushal Bodh' under the National Education Policy 2020, which advocates early vocational exposure and integration of skill-based learning. By grounding vocational interest assessment in the lived educational milieu of U.P. Board students, this research contributes valuable empirical evidence to ongoing national and state-level education planning. Strengthening vocational guidance practices based on data such as these can enhance student preparedness, confidence, and alignment with future career pathways.

### **Suggestions for further study:**

1. Comparative study of vocational interest of students of rural and urban areas.
2. Study of vocational interest in relation to educational background of parents of students.
3. Study of the role of vocational maturity of students in vocational choice.
4. Study of the impact of educational availability of students on vocational choice.

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# Vocational Education in India: Developmental Landscape and Future Prospects with Special Reference to NEP 2020

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## Abstract

Vocational education in India in the form of skill-based training was there as a part of the curriculum in ancient times. Most of the vocation at those times was based on family traditions. The formal structure of vocational education was introduced in India by Britishers because of the industrial revolution wherein they required skilled labour to manage the industries. During the British period many vocational institutes were opened for modernization of Indian education. But, the pace of vocationalisation was slow as easily understood as colonial emperors do not want that Indian outpaced them in trade and industries. During Post-independence, the pace of the vocational education was not picked up though India was passing through the phase of technical development in 1960s, 70s, 80s and 1990s. Vocational education never gets its due recognition due to mind-set of the society that it is inferior in nature. So, in spite of introduction of vocation courses at different stages of education and at different phases of post-independence time line, it was never become the center of attraction for youths. Post 1986 policy, vocationalisation of secondary education as centrally sponsored scheme was introduced which continued till today in spite of several odds in its favour. National Education Policy 2020 has been able to make vocational education an integral component of school and higher education because it has been realized that for Atmanirbhar Bharat revival of vocational education to transform human to skilled based resource, entrepreneur, employer, productive worker. This paper intends to delve into the developmental landscape of vocational education in India and navigate the future prospects with special reference to NEP 2020.

**Keywords:** Vocational Education, Skills, Employment, Economic Development, National Education Policy 2020

## Introduction:

India is thinking of become one the largest economy within this decade with 5 trillion-dollar economy. To become largest economy in the world, India needs to turn its human resource into knowledge-based society as it leads to knowledge-based economy, the driving force for knowledge-economy. India is fortunate enough among all the countries in the world that it has largest share of youngest population. The demographic dividend in terms of youth population will propel the economic growth of the country. Young population not only offers

market place but also large workforce which can contribute to global economy. The large young population will drive the country with their innovations and entrepreneurship. What it is important for India how to reap the demographic dividend of such a huge young population? Education is the only instrument through which this change can be brought about. The population needs to be educated as well as skilled. The two types of education wherein this young population can be diverted would be higher and vocational education as these types of education will prepare young workforce into educated and skillful. Presently, India's Gross Enrollment Ratio (GER) in higher education is merely 26% whereas the global average is 36.7%. Similarly, only 5% of the total workforce of India is skilled whereas this percentage is very high in countries like Germany, Japan, Korea etc. (Government of India, 2020).

As school education is foundation for vocational and higher education, therefore, it is imperative that all most all the children of school going age must be in the school system and they should complete their school education to either go for higher education or vocational education as per their needs and aptitude. In recent decades, India has been gained a lot not only in terms of providing access to school education to the children in the age group of 6-18 years but also the share of school completion has also been substantially increased. Present statistics show that almost 75% of the students who enrolled in schools at the age of 6 years are able to complete their schooling. If we break these statistics at various stages of education, elementary level has completion rate of almost 95% whereas at secondary level it reduces to 80% and at senior secondary level it further drops to 75%. If we compare with among European and Asian countries definitely this figure is not encouraging but if we look back almost two decades back it has been significant improvement. Presently, almost 27 crores students are enrolled in 16 lakhs schools. This figure would reach to 100% by 2030 (Government of India, 2020). Present NEP target of 100% by 2030 is based on the fact that almost all out of school's students would be pulled back into the system using multipronged approach which includes open and distance learning and alternative schooling. As vocational education option starts during schooling itself (Class X), therefore, it is expected that a sizeable population would opt for vocational education and enters into the world of work with proper training and skill. But unfortunately, as the data indicated in NEP 2020 that only 5% of the entire workforce is only skilled which includes the population who are being trained by their father or forefathers in a particular vocation. Before discussing the various recommendations that has been given by NEP, 2020 in regard to vocational education, it is essentially to cover the background why vocational education in India never flourishes in school and higher education?

## **Vocational Education in Pre-Independence Era**

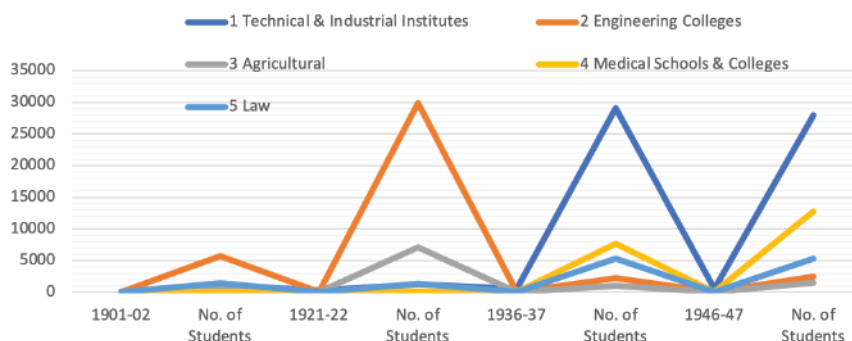
If we begin the journey of human civilizations, since inception it has quest of acquiring knowledge and skills and transmit them to its subsequent generations. Initially, it was learnt in the form of manual skills in different areas whosoever has the interest in particular vocation. Later on, when the society was divided on the basis of vocation (type of work), the knowledge and skills are transmitted from family members, it becomes family tradition. But

with inception of industrial revolution, there arise an urgent requirement of huge labour force to work in these manufacturing and productivity centres. Many of them were given on-site training. Slowly and slowly need was felt that to run these industries in an efficient manner, Industries need trained and skilled workers. So, schools/institutes of training centres were opened to provide training on demanded skills. In other words, training started under experts. In India, too initially education and skills were imparted through Guru. Later on, it becomes a family tradition and continues for centuries till Britishers, felt that it was there need of specialists who can oversee the various works related to construction and engineering, law, medical etc. that force them to set up vocational institutes to fulfill their administrative needs in India. In fact, formal structure of vocational education and training was introduced by Britishers, though there many instances in India wherein Indian started factories/Industries and hired educated Indians and trained them in various skills but efforts were very limited. So, large scale training of humans in a particular set of skills was initiated by Britishers. Here it is important to mention that today whom we called professional education, was started by Britishers as vocational education. That's why medical, engineering, legal education was focused. Unfortunately, Indian traditional skill-based vocations like pottery, jewelry making, weaving, carpentry, etc. were never part of their so-called vocational education. British government opened the vocational institutes with their ulterior motives. In fact, it was not before 1854 When Wood Dispatch report recommended for vocational educational at secondary stage. Thereafter, several commissions and committees recommended for vocational education and training at various levels of education like Indian Education Commission (1882), Hartog Committee (1929) , Sapru Committee (1934), Wood-Abbot Committee (1936), Sargent Report (1944) etc wherein it had been emphasized diversification of courses at different stages of school education to prepare youth for different walks of life (industrial and commercial career) as it is essential for country's economic development. The status of vocational education prior to Indian independence is captured in the table 1 and figure 1:

| Type of Vocational Education      | 1901-02 | No. of Students | 1921-22 | No. of Students | 1936-37 | No. of Students | 1946-47 | No. of Students |
|-----------------------------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Technical & Industrial Institutes | 84      | 1175            | 276     | 1277            | 546     | 29097           | 490     | 27940           |
| Engineering Colleges              | 31      | 5707            | 16      | 29931           | 8       | 2194            | 17      | 2500            |
| Agricultural                      | 4       | 552             | 8       | 7090            | 6       | 1008            | 17      | 1500            |
| Medical Schools & Colleges        | 22      | 41              | 24      | 122             | 33      | 7663            | 51      | 12751           |
| Law                               | 5       | 1399            | 1       | 1322            | 20      | 5332            | 13      | 5332            |
| Total                             | 146     | 8874            | 325     | 39742           | 613     | 45294           | 588     | 50,023          |

Source: Bhatt, 1972, pp. 367-375

*Table 7.1: Scenario of Vocational Education Prior to Indian Independence*



Source: Bhatt, 1972, pp. 367-375, Compiled by Authors

*Figure 7.1: Vocational Education Status in Pre-Independence Era*

The two things have been observed from the table that though various commissions and committees recommended highly about vocational education and training, Britishers never opened the network of vocational institutes across India in proportion to the total population, mainly because of their ulterior motives. Moreover, in the last decade before Independence, 1936-37 to 1946-47 there is a decrease in number of technical and industrial institutes, so is the number of students contributing to the factor that government was in no mood to provide technical and vocational courses to Indians as it would create demand for employment. The British government showed no interest in developing a robust plan of technical and vocational education in India as they believed that it would weaken the trade and commerce of the England (Nurullah & Naik, 1962). Moreover, the government had vested interest in producing clerks who are loyal to them and propagate their western knowledge among Indians. Another reason for non-promotion of vocational education is lack of funding from imperial government. It is also to reiterate that Indians too have a very indifferent attitude towards vocational education. They prefer to have general education through which they earn white collar jobs rather than doing vocational course which opens up blue collar jobs (manual).

Here it is important to understand that vocational education and training given by the family members in term of its knowledge, skills and learning experiences is in its rudimentary form and hardly being updated with changing knowledge and skills. Whereas vocational education and training provided by the vocational institutions is based on scientific development of a vocation and it involves structured, organized form of learning means knowledge, skills and learning experiences imparted are updated with latest development in the field. So, one can say that prior to Independence, vocational education and training offered in India to some extent was based on latest development in the field in the institutions sponsored by imperial government but it was largely confined to family and family traditions.

Vocational Education in Post-Independence Era: India after Independence has legacy of few educational institutions wherein vocational education and training was being imparted. Post-Independence, University Education Commission (1948) was constituted to look at the status of university education and recommends for betterment of higher education. Commission also emphasized for the need of vocational education to meet the diverse needs of men and women. Similarly, Secondary Education Commission (1952) also recommended for vocational education and recommended for diversification of courses after eight years of schooling. Kothari Commission too emphasized the need for vocational education and recommends diversification starts at +2 level with almost 50% of the secondary must go for vocational courses. It also recommended that some craft-based education in form of Some Useful Productive work should be started from class VI onwards till class X. Thereafter, document on Higher Secondary Education and its Vocationalisation by NCERT (1976), Working Group on Vocationalisation of Education (1977), Malcolm Adiseshiah Committee on Higher Secondary Education (1978) with special reference to vocationalisation discussed the various issues related to mainstreaming of vocationalisation in school education like restructuring of school education, curriculum, vertical mobility of students opting for vocational courses, establishment of National Council of Vocational Education and Training (NCVT) with corresponding State Councils etc to facilitate the vocational education in national education scene. But it was the Report of the National Working Group on Vocationalization of Education (1985) which made a comprehensive review of vocational education in the country. The Group pointed out that the lofty propositions regarding the expansion of vocational education across India reiterated in the documents of the Kothari Commission (1964-66) and the National Policy on Education (1968) as well as in the consecutive Five-Year Plans (FYPs) were not properly implemented primarily owing to resource crunch, fragile management structure, inadequate technical expertise and defective teacher preparation (Verma, 2018). The Group (1986) further clearly defined the term ‘vocational education’ in a broad sense by covering “all educational programmes that aim at job orientation and develop in the individuals knowledge and skill” (Government of India, 1996, p. 81) at secondary, higher and degree levels. Considering all the prevalent limitations, the Group prescribes guidelines for the development of the vocational education at different levels and made recommendations on management system, strategies for implementation, role of government and non-government organisations and financial implications. It also fixed the national target of 10% percent of total students of higher secondary to be diverted to vocational education by 1990 and 25% by 1995 (Ibid, 1986). Based on it Centrally Sponsored Scheme (CSS) of Vocationalisation of Education was started at national level in 1988 and subsequently reviewed by POA (1992) and extended the deadline to 2000. The scheme was strengthened in subsequent five-year plans with greater allocation of budgets. Tenth five-year plan was important for vocational education as national working Group under Planning Commission proposed several far-reaching recommendations for vocational education and training like competency-based curriculum, modular approach, credit transfer, multiple entry and exit, vertical and horizontal mobility, linkage with university, industry-institute linkage, apprenticeship in local industry after completion of +2 and much more (Majumdar, 2012). The steering committee on vocational education recommended that vocational education at school level, polytechnics, ITIs should come under state government

for better networking, optimal utilization of resources, better linkages with industry, focused targeting. A separate allocation of 350 crores is given for strengthening vocational education under CSS. The Working Group on Vocational Education for the Tenth Five-Year Plan recommended that

a) Networking with Ministries/agencies and networking with other stakeholders for optimal utilization of resources ... (b) The existing system of testing system of assessment in testing for the VE pass outs is generally done by the State School Boards. It does not have high degree of credibility and acceptability from the employment angle. Professional bodies and associations may be encouraged to develop their own system of assessment and certification of VE taken up by schools (Government of India, 2001, p. 14).

The Working Group also suggested the following major revisions in the CS Scheme of vocational education –

|    |                                                                                                                                                                                                                                |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | “The vocational courses in schools should be competency based and in modular form with credit transfer system and have provision for multi-point entry/exit;                                                                   |
| 2. | There is a need to establish linkage between vocational courses at +2 level and courses at university level;                                                                                                                   |
| 3. | Existing scheme should be strengthened by involving industries through signing of Memorandum of Understanding, design of the course, development of curriculum, training of faculty/students and certification of the courses; |
| 4. | For sustaining the scheme, school may consider charging fees and the courses may be designed on self-financing basis;                                                                                                          |
| 5. | The apprenticeship training facility needs to be utilized fully and made compulsory;                                                                                                                                           |
| 6. | Persons with disabilities should be given special treatment while designing vocational courses and their needs and integration into courses should receive appropriate attention while designing and launching of any course;  |
| 7. | Financial assistance may be provided under the scheme for creating testing and certification systems in States in co-operation with user bodies and professional associations; and                                             |
| 8. | AICTE’s vocational education board needs to be reactivated for providing technical support to school system and for establishing linkages with other technical institutions”.                                                  |

Source: Government of India, 2001, p. 15

*Table 7.2: Major Revisions in the CS Scheme of Vocational Education*

Though recommendations of the steering committee in connection to the vocational education were excellent but unfortunately, they were never capitalized. Numerous numbers of research studies have shown that in India there is a persistent skill gap in different sectors in India (NASSCOM 2011; Mehrotra 2012; Jamal and Mandal, 2013, Chenoy 2012 cited in Mehrotra, Raman, Kumra, Kalaiyarasan & Röb (2014)). This persistent skill gap has resulted not only into increase in unemployment but also not-contributing to knowledge economy. Unfortunately, the percentage of population in the age group of 15-59 years who were formally skilled and trained in vocation is just over 2% whereas this percentage was just 2.4% in case of person who received vocational training through informal means (Mehrotra, 2012 cited in Mehrotra, Raman, Kumra, Kalaiyarasan & Röb (2014). Moreover, the quality of vocational training is so poor that it hardly matches with the requirement of labour market. Another major concern was that general education has been divorced from

vocational education. Realizing the acute shortage of skilled manpower and increasing skill-based employment opportunities within and outside India, greater thrust for vocational education by national government was realized. Government was mulling over the thought of increasing the capacity of skilled workforce from 11-12 million to 14-15 million per year so that gaps for the skilled persons be bridged. Not only that, government also thought of having unified system of national qualification which not only covers vocational education at school and at higher level but also transcends the boundary of vocational and link with general education and vice-versa. Therefore, for the planned development of the skills in the country, a policy on skill was needed which was highly inclusive. So, under the National Skill Development Initiative, National Skill Development Policy (NSDP) came into existence in March, 2009. The policy recognized that two essential components to drive the economy in the country would be skill and knowledge. Since India has limited capacity of skill development programs, therefore, present capacity needs to be augmented. A target was fixed that by 2022 around 500 million people of the workforce would be skilled and for that coordinated efforts from central, state, industries, technical institutions, would be needed. The challenge was not only to increase the capacity of the vocational institutions but also skill and re-skill the people who are already working in various organized and unorganized sectors. It is necessary to recognize their prior learning (RPL) and provide certification which is equivalence to certain level of vocational education hierarchy. The Ministry of Labour and Employment drafted National Vocational Qualification Framework (NVQF) and Ministry of Human Resource Development (MHRD) proposed National Vocational Education Qualifications Framework (NVQEF) as both of them are dealing with the subject of vocational education. One Framework is for school, higher level and other for technical level. National Skill Development Corporation (NSDC) which was established in 2008 was entrusted the responsibility to implement the policy. NSDC constitute Sector Skill Councils (SSCs) which have the responsibility of: identification of skill and its range and depth; determining the standards and qualifications; standardization of affiliation and accreditation; training of trainers etc. The focus of the policy on equity and access, vocational training of women, bridge the regional imbalance by creating opportunities, special initiatives for minorities, divyangjans, school drop outs, children engaged in child labour and socio-economically disadvantaged groups. By 2009, almost 10,000 ITIs were providing vocational education with a capacity of 15 lakhs whereas this percentage in school education almost 9000 sections in school education in roughly 10000 schools. In 2013, both the framework was merged into National Skill Qualification Framework (NSQF) which was notified in 2013 and National Skill Development Agency (2013) was given the responsibility to operationalise NSQF in terms of quality and standards as per the specific requirement of the skill. It is important to mention here that NPE-2020 also talked about NSQF which has 10 levels and each level is defined in terms of learning outcomes in five domains with descriptors at each level i.e., process, professional knowledge, professional skill, core skill and responsibility acquired either through formal, non-formal or informal learning. Although prime responsibility was given to NSDA, Sector Skill Councils, central ministries, state, and regulatory institutions were also designated. The NSQF was anchored on NSDA but its implementation responsibility would lie on National Skills Qualification Committee (NSQC). Till 2013, effort was that vocational education should be

competency-based and integrated with general education that transcends the boundary of general and vocational education and encourage mobility of the learners into either side seamlessly.

With the change in the government at the centre, vocational education gets a major boost. In July 2014, Department of Skill Development and Entrepreneurship, upgraded to full-fledged Ministry of Skill Development and Entrepreneurship (MSDE) in November 2014 to achieve Skill India in mission mode. To achieve skill India, National Skill Development Mission (NSDM) was started in 2015. Furthermore, National Policy on Skill Development & Entrepreneurship, 2015 was launched (supersede earlier policy of 2009) with the objective of “Skilling on a large Scale at Speed with high Standards and to promote a culture of innovation-based entrepreneurship to ensure Sustainable livelihoods for all citizens in the country” (Government of India, 2015, p.12). This policy is an umbrella framework which includes all kinds of skilling activities going on in the country and aligns to common standards and links the skilling to market. To achieve mission of Skill India, efforts of NSDC, NSDA and DGT was converged. In 2016, all skill development activity of the country was aligned with national policy and NSQF. In subsequent years PMKVY-2.0 and 3.0 were launched along with giving big boost to state skill mission. PM Kaushal centres were opened across India in the core sector skills with participation of private players. Several schemes were introduced to give a major boost to skill education at formal and non-formal centres of education (see website of <https://www.msde.gov.in/> for short term training, long term training, apprentice training, entrepreneurship schemes, and other schemes). As per the UNESCO Report Vocational Education First (2020), since inception NSDC has alone build the capacity of over 25 million youths and adults by giving training in various sector skills through private-public partnership. Report further said that MSDE and other central ministries contributes to training of 10 million youth and adults annually in the country (NSDC contributes 5 million annually) via different short-term programmes on various sector skills based (specialized training) on the demand of the industry at the entry level. Report highlighted that long term training programmes are being are generally done by polytechnics and ITIs which together have additional 3 million capacity. Secondary schools too are involved in vocationalisation of education after the launch of centrally sponsored scheme in 1988, thereafter 10158 public funded schools offer vocational education to over 1.2 million students. CBSE schools too offer vocational education from grade 6th onwards but the number is miniscule i.e., 8583 schools. Even in higher education, almost 1000 colleges are offering B.Voc programmes from 2013. Even the state government through their State Skill Development Mission (SSDM) have made an impressive progress in last few years. But overall, big gap persists between skilled and trained manpower required and the intake capacity of the institutions (Wadia & Dabir, 2020, p.9). The prime reason for the slow growth in vocational education is that mindset of the stakeholders. People are obsessed with white collar jobs and look down the blue-collar jobs. Prior to Independence, there is a great advocacy by Mahatma Gandhi and others for craft-centred education (another form of vocational education) but post-Independence Indian policy makers found that it is not popular among the common people sentiments and as a result it remains confines to only few. Another common reason is that those who cannot cope with

mainstream education, vocational education is meant for them. Another significant reason is that there is a hard separation between general education and vocational education. For last seven decades, a general pathway is not created for seamless mobility of students of vocational education into general education. Another important reason needs to be highlighted is that though vocational education institutions were opened, their curriculum was never matched with the of skills and competencies required by the industries, therefore, even though they were trained but remain underemployed or unemployed. Before, 1990 India has only handful industries mostly engaged into manufacturing sector and most of them are controlled by central or state governments. Even if there are private industries mostly run by families who have learnt those skills from families. But after 1990, when several sectors are privatized or new sectors are introduced in Indian markets, suddenly India needs large number of skilled workforces. This has been catalysed by the policies meant for information technology sector which opens new vistas of opportunities in almost all the sectors especially in service sectors and India finds themselves in shortage of skilled workforce. In last 10 years there has been unprecedented growth in IT and allied sector and India too has ramped up the capacities of institutions offering vocational education but demand is too high especially in sectors like travel and tourism, medical lab technology, data mining, food packaging, etc. In fact, as per the sector skill councils there are 38 identified sectors where India will have employment in coming decades but only 10 sectors are there where majority of the youth population is getting training. Still there are 28 sectors where India requires large skilled labour force. Like other countries, India has also faced worst situation during the COVID -19 where economic activities came to almost standstill. But after Covid-19, India is slowly reviving its economy because of the large scale of entrepreneurship in various fields. Education and training are one of the sectors which have been hugely benefitted out of the Covid-19 because of the digital initiatives by the private and government sectors. Various opportunities in education educator open-up for online education like web-based platforms, app-based digital content, learning management systems, etc flourished in the market in last two years. Presently, market needs not only technologist but pedagogist, curriculum designer, content developer, content programmer, content editor, audio and video broadcaster etc. Similar is the medical field especially traditional like ayurvedic, yoga wherein Indian has largely benefitted out of by practising yoga and taking ayurvedic routes during Covid times. India needs large number of trained yoga and ayurvedic specialist. NEP-2020 has come in right time wherein India is in transition phase and needs a direction wherein it emerges as global power-house in terms of knowledge and skills. NEP-2020 has looked education in holistic perspective and that is why even the structure of education has been overhauled so that present youth can seamlessly move both horizontally and vertically in various types of education-formal to open and distance learning, general to vocational, technical to general with no hard separation between academic, vocational and technical education. NEP-2020 recommends that each and every institution in higher education will be multidisciplinary wherein students have the option of choosing some academic, some skill based, some art based, some life-based education in various years of study so that learners can be groomed into a citizen who have broader horizon of knowledge. Keeping this in perspective, vocational education title has been given Re-imagining Vocational education in para 16. NEP-2020 has been

shown a serious concern towards vocational education in the country and found that like general education it is too highly fragmented, not-updated and upgraded obsolete, highly compartmentalized, isolated. NEP 2020 highlighted that to become Atmanirbhar Bharat, vocational education in schools, Jan Shiksan Sansthan, ITIs and polytechnics, polyclinics, etc need to be revamped. Before going into the discussion of the various observations and recommendations of NEP 2020 on vocational education, let's look at the dominant barriers to vocational education in India.

## **Roadblocks to Vocational Education in India**

Wadia & Dabir (2020, P. 11) in the State of the Education Report for India 2020: Technical and Vocational Education and Training (TVET) and National Policy on Skill Development and Entrepreneurship, Ministry of Skill Development and Entrepreneurship (Government of India, 2015) have reasonably pointed out the following major challenges of vocational education in India are as follows:

1. Mindset prevalent in the parents and other stakeholders for vocational education as it is meant for those who are less intellectual or not good at academics;
2. Sensitiveness and awareness among school and higher education officials, management, administrators, and teachers towards the know-how of vocational education;
3. Provide inclusive access to vocational education to children belonging to SEDGs
4. There is an urgent need of blending vocational courses with digitalization
5. Creating opportunities of re-skilling, upskilling and lifelong learning in emerging areas of vocations;
6. Adequate funding and lighter and tighter regulatory framework for scaling-up the capacities of vocational institutions;
7. Integrating the vocational education with general education and offering it at school and higher education level as part of the curriculum;
8. Higher percentage of labour force is working in unorganised sector.

## **NEP 2020 and Vocationalisation of Education**

The vocational education has been the matter of concern for policy maker can be gauged from the fact that in 66-page document, 76 times word 'vocation' in different context has been used. Somewhere it has been used school education, somewhere it has used with subject and somewhere it is related to training and capacity building and some other it is used with skill, employment, and entrepreneurship. In fact, one can say that skill (synonymous with vocation) and technology has been the two-buzz word in entire NEP-2020 document. As far as para 16 on Re-imagining Vocational Education, it has eight sub-paras highlighting the concerns, recommendations, and road map for vocational education in the country till 2040. Some of the major concerns/observations related to present vocational education pointed out by NEP-2020 are as follows:

- In spite of having high percentage (66%) in the age group of 15-59 years (productive years), only 5% is formally trained in some vocations whereas this percentage is as high as 96% in case of south Korea;

- Vocational education has been concentrated to small number of students as it offers as an option in grade 11th and 12th as well as to students who have been dropped out after 8th grade. Moreover, vocational education has limited pathways of horizontal and vertical mobility thus restricting the entry of such learners to higher education especially in mainstream education (academic subjects).
- Mind-set of stakeholders that vocation education is inferior to mainstream education and students who are unable to cope with general education switch to vocational education.
- Emphasizing the dignity of labour and importance of different vocations in the different phase of life of the individual;

NEP 2020 has made the following policy recommendations of NEP 2020 on vocational education (Government of India, 2020, para 16.1 to 16.8):

- Increase the base of vocational education by integrating vocational education to all educational institutions-school, colleges and Universities;
- Increase the vertical mobility of students via National Skill Qualification Framework (NSQF);
- Offering vocational education to students by re-packaging it;
- Vocational education exposure to all the children as earliest as at middle level and integrating with the mainstream education this will ensure the inculcation of dignity of labour at early age;
- At least 50% of the school and higher education students will be exposed to vocational education with clear action plan, timeline and targets and it is consonance with SDG target 4.4;
- Development of vocational and academic capacities of students simultaneously
- Collaboration of secondary schools with various educational institutions like ITIs, Polytechnics, Local industry,
- Establishment of Skill labs in schools in hub and spoke model
- Continuing of B.Voc degrees in higher education as well as offering vocational courses to other bachelor programme including 4 year multidisciplinary UG programs;
- Offering indigenous based vocational courses under lokvidya;
- Vocational education would be expanded through ODL mode;
- Skill gap analysis and mapping of local opportunities for providing vocational education;
- Constitution of National Committee of Integration of vocational education (NCIVE) to overall monitor the vocational education and its integration in school and higher education;
- Setting up of incubation centres at higher education institutions in partnership with industries and sharing of best practices/models;
- NSQF will be strengthened and it will be aligned as per the international standards of classification of labours recognized by international labour organization;
- Drop-out students will be mainstreamed and align their prior learning experience with the relevant level of framework;
- National Credit framework for seamless movements of students from vocational to general education and vice-versa;
- Hiring of local experts or people of eminence who have contributed immensely in

vocational field like carpentry, painting, sculpture, music, arts, pottery, etc in schools and in higher education;

- Bag less days for class 6-8 for 10 days in a year to visit to place for exposure in several vocations; and
- Introduction of vocational courses from class 6 onwards till class 8 and after 8th some skill-based courses would be offered as part of the multidisciplinary education.

These are major recommendations of NEP 2020 wherein efforts have been made by the policy maker not only to highlight the existing concerns in offering the vocational education in the present education system and suggested how vocational education could be integrated into mainstream education. The latest UNESCO report by Wadia & Dabir (2020) has highlighted that National Education Policy, 2020 has embraced the UN SDG agenda of 2030 completely, and NEP is talking about changing the eco-system of school and higher education especially the vocational education in the country which has long been stigmatized.

## **Conclusion**

In past one decade knowledge and skill-based education has been the hallmark of almost all educational policies. It has been realized that India would become global hub of knowledge and skill in the coming decades. To reap the benefits, it is necessary that India should have knowledgeable and skilled workforce almost in all the sectors of the economy. Vocational education is being seen as education which has the capacity to translate the human resource into productive beings. NEP-2020 has sensed it and suggests that no education would be complete without imparting vocational education as it would help India not only to become Atmanirbhar (Self-reliant) in terms of economy but also fight against the biggest social issue i.e., unemployment and vocational education makes individual to be creator of employment rather than seeker of employment.

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## PSS Central Institute of Vocational Education

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), set up in 1993 at Bhopal by the Government of India, is an apex research and development organization in the field of vocational education. It is a constituent unit of National Council of Educational Research and Training (NCERT), established by the Ministry of Education, Government of India.

The PSSCIVE is a UNESCO-UNEVOC (International Project on Technical and Vocational Education) Centre in India.

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