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CONTENTS

ARTICLES

BOOK REVIEWS

Journal of Educational Planning and Administration
Volume XXXVII, No. 4, October 2023, pp. 289-304

An Analysis of the PPP Model in School Education

Bhuma Sundar Raman*

Abstract

The 2019 pandemic has resulted in a loss of learning for millions of children. Further, given the loss of income among the poor due to the pandemic, the children from the marginalised sections are being enrolled in droves in municipal or government schools. As such, the quality of education in these schools needs tremendous improvement if these children are not to be left behind in India's development story. The PPP model in school education can be one solution to this end. The existing literature on PPP model in school education is equally divided between those who believe that the PPP model can fill in the gaps in the public education system in terms of access and quality, and those who believe that the PPP model exacerbates the socioeconomic inequalities and hence the government cannot abdicate its responsibility of providing a public good. The central government in the Eleventh Plan had envisaged a Model School Scheme which included setting up of 3,500 schools in educationally backward blocks (EBBs) through State/UT Governments, and 2,500 schools under Public-Private Partnership (PPP) mode in blocks which are not educationally backward. This scheme has met with limited success at the state level; the Central Government later scrapped its own role and left it completely to the states to implement the scheme. Recently, the New Education Policy (2020) has envisaged a big role for the private sector in developing India's education to the world class levels. This paper is an attempt to analyse the PPP model in school education for which the existing models at the national level have been studied and recommendations for implementing the PPP model in the current education scenario have been outlined.

* St. Mira's College for Girls, C 101, Neco Sky Park, Vishalnagar Pimple Nilakh Pune 411027. Email: coolbhuma.raman@gmail.com

Rationale for PPP

The Annual Status of Education Report (ASER) shows heartening results in terms of the high enrolment rates in India at 98.4 per cent; in fact, the proportion of children currently not enrolled in school has dropped since 2018, even for older girls. However, the learning outcomes are far from encouraging with reference to reading and math (ASER 2022: 49-51). The PPP model in education is a viable and sustainable solution to provide quality education in India. While easing the budgetary and capacity constraints of the government in providing education for all, the PPP model can also considerably improve the quality of education imparted especially in the rural and interior areas. Poor families prefer to send their children to private schools in spite of the high fees due to the higher accountability of teachers in these schools; schools under the PPP (private-public partnership) model will attract more students in this context as the teachers are accountable to the management while in government schools there is no teacher accountability. Further, with the government sharing the per capita student cost, the private operator's financial burden is considerably eased. The PPP model will also bring in more efficiency and professionalism into the system as the processes involved (building infrastructure, recruiting teachers, etc.) are executed speedily by the private operators as compared to the government sector. The increased number of players in the market leads to greater competition, thus reducing the costs while maintaining high standards in education. Thus, the PPP model can play a vital role in providing access to quality education at low costs for all.

Literature Review

Alam and Rasheed (2010) have suggested two approaches of PPP funding in the BOT models – Viability Gap Funding and Annuity Payment – which will incentivise the private operators by providing subsidies in the construction or operation of the project. These models are not only economically viable for the operators, but also result in greater quality of the education programmes.

The Asian Development Bank (2011) has prepared a toolkit for the PPP model of education which can be adopted in Maharashtra. The toolkit provides a framework wherein the objectives in terms of betterment of infrastructure and upgrading the quality of education in government schools are achieved by plugging the existing gaps in the same through PPP model.

Aslam et al (2017) have undertaken a rigorous review of the evidence with respect to PPP in education in developing countries with the main objective of assessing the impact of educational PPP on learning outcomes for children. They have reviewed three main PPP models – Contract schools (Colombia and Pakistan), Government subsidies to non-state providers (Colombia, Pakistan, Peru, Philippines, Sierra Leone, Uganda and Venezuela) and Voucher schemes (consisting of nine studies, six of which are in the context of Chile, one in India, one in Pakistan and one is a systematic review covering various contexts). *In all the three arrangements, the authors found the evidence either insufficient or inconclusive.* According to their study, while non-public schools may show evidence of improving learning outcomes, this improvement may not be a very substantial change given the overall low levels of attainment across the entire education system. Nevertheless, the existence of PPP

models in education under such circumstances may lead to improved access to schooling which would still be an improvement over a situation where children may not otherwise be attending school. Hence, judging PPP model on the basis of learning outcomes alone may not be justifiable. Finally, the authors believe that while the evidence on different types of PPPs and their impact on educational outcomes is growing, there is an absence of rigorous scientific eveidence on the basis of which definitive conclusions can be drawn.

Butta (2018) in his article for the Observer Research Foundation, has argued for the introduction of PPP model in education in India along with a revamp of curriculum and increasing academia-industry connect.

Bous (2019) has studied the evidence from Uganda and Pakistan on education PPPs and found that the quality of education in PPP schools was poor due to low level of investment and poor quality of teachers. While students in PPP schools in Uganda performed poorly in educational outcomes in comparison to students from government/other private schools, it was found that predominantly female teachers in PPP schools in Punjab, Pakistan were poorly trained and received less than half the minimum wage. Overall, in both the cases, there were no adequate oversight systems or accountability to communities in place. According to the study, an increasing reliance on PPP and private schooling threatens to increase inequality between the rich and the poor as also between boys and girls.

Davirro (2023) has reviewed the literature on PPPs and identified four crucial factors which positively affect the success of PPPs in learning outcomes. These include tying per student subsidies to outcomes, locating the schools strategically in hard-to-reach places, making the private management stronger with greater accountability and autonomy, and the government providing strong oversight and monitoring the PPPs. These suggestions are based on the four key findings of the author: (1) per-student subsidies are the most effective model of PPPs for improving both access and learning outcomes, (2) PPPs have the greatest impact when they are strategically located in remote areas, (3) successful PPPs require high quality school management, internal accountability and autonomy to adapt as per the situation, and (4) Government oversight is essential for ensuring equity and improving learning outcomes for the most disadvantaged students.

Enge et al (2010) conducted two case studies on PPP in education in Rajasthan in order to gain insights into the challenges and best practices of PPPs in education so that funders and development practitioners can better design and implement education PPPs. Their key findings suggest: (1) defining attainable goals and outlining expected tangible results so that the private sector gets a clear strategy on achieving visibility and recognition, (2) understanding and respecting the local sociocultural dynamics possibly by engaging the local staff, (3) increasing the participation of the community, especially women and other marginalised groups for successful outcomes of the project, and (4) strong communication and mutual respect among stakeholders and thus strengthening the relationships as well as using and strengthening current infrastructures for winning the confidence of the target population rather than building parallel structures.

Fennell (2007) used the Hirshmanian concepts of 'exit' and 'voice' to identify the economic and political aspects of provision of education. While lauding the performance of 'Pratham' and Aziz Premji Foundation in Early Childhood Education initiatives, she has highlighted the nuances of private participation in a public good.

LaRocque (2008) has undertaken an extensive literature review of the international experience with PPPs at the basic education level. The study has covered various forms of PPPs like private philanthropic initiatives, private sector management initiatives, private school funding programmes (e.g. subsidies and vouchers) etc., across countries like US, Colombia, Spain, Qatar, Pakistan, etc. He concluded that contrary to general belief, private participation in basic education is not necessarily skewed in favour of the better off section of society. In fact, PPPs are serving the poor populations that are not being provided for by the existing education systems as in the case of Colombia and the Philippines. According to him, though there is a lot of research on charter schools in the USA and vouchers, the evidence on other PPP models is limited. He suggests a strong regulatory framework, flexibility in provision and quality assurance as fundamental requirements for implementing a successful PPP model.

LaRocque and Lee (2010) have highlighted the issues, opportunities, and challenges related to non-state providers and their partnerships with the State in fulfilling the rights to education for all in East Asia and the Pacific. They recognise the State as being ultimately accountable for the equitable provision of education services and have looked into the challenges faced by schooling funded and provided solely by the State. According to them, PPPs in education have several benefits including widening access to education; improving the quality of education through adoption of pedagogical or technical knowledge, skills and innovations; and increasing short-route accountability (local-level rather than long-route political process) which influences the demand for education. However, PPPs have also been criticised and the chief concern about this model is the capacity of the government to design, implement, and monitor the system effectively; considering that the poor income countries have fragile and inexperienced governments, this lack of capacity can lead to financial and quality risks. At the same time, the non-state sector is also not sufficiently developed to provide quality education on the scale required, especially in poorer areas. The governments in developing countries may also suffer from a lack of adquate regulatory and policy frameworks as well as administrative systems which may act as obstacles in the effective implementation of PPP in education. A cumulative result of the above weaknesses of the government could result in a loss of its accountability to the public. Thus, PPPs cannot be seen as a panacea for the provision of education to all; the government has to live up to its principal role as a provider of this public service but intelligently designed and implemented PPPs specific to the context can help in addressing the capacity gaps of the State in providing education for all.

Latham (2009) has discussed the pros and cons of public-private partnerships in education. He has listed six reasons proponents of PPPs list for establishing a causal relationship between PPPs and improved educational outcomes. These inducing competition, allowing more flexibility in management, open bidding of contracts which by itself increases quality of education, optimal risk-sharing between government and private sector, higher standards of education through stipulation in the contracts, and sustainable solutions in education reform by leveraging the strengths of government, private sector, and civil society stakeholders. He has highlighted the main criticisms against PPP in education as well – reduced government control over public provision of this service, increasing socio-economic segregation through self-selection of students from better background into high-quality schools, and the deterioration in the quality of public schools due to lack of pressure from

better-off parents to improve quality. He has also suggested several measures for effective implementation of PPP in education including setting up clear and objective establishment criteria and streamlining processes for registering private schools along with providing subsidies to private schools mainly in the form of infrastructure.

Luthra and Mahajan (2013) have elaborated the need for PPP model of education in India; the various options for PPP as outlined by the World Bank; the different PPP models being adopted by countries across the world and finally suggested ways for effective implementation of this model in India.

Mehta et al (2014) have summarised the major issues facing the education sector in India, namely, lack of adequate physical infrastructure; poor teaching quality; and inefficient management in schools. They have argued that while PPP/PFI models are shown to have a favourable outcome in terms of infrastructure and quality in education, the empirical evidence in this respect is limited. After analysing the existing PPP models in five states in India, they have highlighted the fact that the current models are not sustainable since they are heavily dependent on donors; as such the scalability of these models is questionable. The team has suggested PPP models to improve infrastructure and quality of educational services as also for residential schools in rural areas.

Pichhili et al (2021) have studied the PPP model run by the Education Department of the Municipal Corporation of Greater Mumbai (MCGM) for the delivery of Early Childhood Education (ECE) through 'balwadis.' The report identified the gaps in the design and implementation of the model which could impact the outcomes in terms of equity and quality of education. In order to increase State regulation over PPPs, particularly for ECE, the report suggests adherence to a policy framework for delivery of ECE in the state.

Rinda and Shah (2022) have evaluated the performance of Education Management Organisation (EMO) programmes in Sindh, Pakistan. They found that PPPs through EMOs had greater autonomy and decentralization and hence the governance of schools in terms of accountability, monitoring, and evaluation had improved. However, outcomes in education with reference to increase in access, overall quality and equity in these PPP schools was found wanting in creating a major impact. More importantly, the future of these schools was uncertain since there was no surety about renewal of contract.

Tilak (2015) has examined the strengths and weakness of PPP in education and the possible ramifications of PPP for education development in India. According to him, PPP experience in India shows that there is huge transfer of resources from the state exchequer to the private players with very less control on the part of the State over the activities of the private sector. As a result, education is becoming a highly commercialised activity with the private sector trying to maximise profits with very little contribution from their end. While there is limited evidence on the benefits of the PPP model, the benefits of a public education system are well established. In fact, the PPP model suffers from several drawbacks including lack of scale and widening inequalities where non-philanthropic private players are involved.

Verger and Moschetti (2016) have argued that while many developing countries are inclined to adopt the PPP model for enhancing the performance of their educational systems, an alternative to PPP schemes for service delivery (i.e., schooling) can take the forms of multi-stakeholder partnerships for capacity building and support services.

They believe that increasing equity and quality of education can be achieved without sacrificing the basic premise of public education in a welfare state.

Research Methodology

This paper is an attempt to analyse the PPP model in school education for which the existing models at national level have been analysed and recommendations for implementing the PPP model successfully in the current education scenario have been outlined. This is a descriptive paper for which detailed literature review has been done. It is based on secondary data (various reports of World Bank, research foundations, and governments) and the provisions of the National Education Policy (NEP 2020) have been highlighted with respect to PPP in school education.

Objectives

i. To study the existing PPP models at the national level as well as the provisions pertaining to PPP in school education in the New Education Policy.
ii. To suggest reforms to the existing PPP models in India to achieve equity and quality education for all at the scale required.

Literature Gap

Various expert studies have suggested different PPP models with a view to bridging the existing gap between availability and requirement as well as enhancing the quality of education in India. While the models/solutions suggested are generic and maybe applied to new schools being established, they do not suggest ways of improving the existing public education system. This paper is an attempt to not only suggest a desirable PPP model for newly established schools, but also to revamp the current government schools and government aided schools which are catering to a large section of the population.

Existing PPP Models in India

Chaudhry and Uboweja (2014:11) have discussed the options facing low-income families in the current Indian education system:

i. *Government schools:* These schools provide education to around 60 per cent of children at the elementary level but they are of low quality in terms of learning outcomes.
ii. *Government aided schools:* These schools are run by private educational trusts but they are provided significant funding by the government; however, their performance varies across states.
iii. *Affordable private schools:* These schools charge fees in the range of Rs. 300 to Rs.700 per month in urban areas but many are not Right to Education Act (RTE) compliant.
iv. *Donor funded schools:* There are very few such schools due to the high dependence on donors.

v. *25 per cent reservation in elite schools as per Right to Education Act (RTE):* The implementation of this provision varies across states and faces significant implementation challenges.

While the role of the government in providing school education has been very prominent in India, the PPP model is also widely prevalent, primarily in the form of government aided schools. The different PPP models existing in India have been elaborately discussed by Chaudhry and Uboweja (2014). Some of them are:

Government - aided schools: These schools are established by local residents' organisations in areas where the government is unable to set up the school. The objective of this model is to increase access to schools; at present over 16 million elementary school students are enrolled in aided schools. The aided schools follow the state board curriculum and have to admit all students that apply for admission. Under this model, the private sector bears the cost of establishment of the school and also appoints the teaching and non-teaching staff. After the school is run for some time as a private unaided school, the government steps in and provides grants for teachers' salary (generally 100 per cent) and in some cases even part or full of the non-salary recurring cost. Being aided schools, the fees are regulated and equivalent to those in government schools; however, the management continues to remain in private hands. The aided status, once granted is enjoyed indefinitely by the school and is not linked to the attendance and/or performance of students/teachers.

Residential schools in Andhra Pradesh: As per this scheme, the State Government of Andhra Pradesh is proposing to establish one residential school per assembly constituency, primarily in the rural and peri-urban areas. For this, the State Government is partnering with NGOs, various educational trusts and foundations to whom the land for establishing the schools will be provided free of cost on a long-term lease. The non-recurring costs of construction would be borne by the private partners and they will be able to fill up 25 per cent of the seats through management quota. The bulk of the seats (75 per cent) will be sponsored by the State Government through the payment of the recurring costs. At present, there are 164 schools established under this scheme.

Adarsh schools in Punjab: This scheme proposes the establishment of one school per block for which the private sector has been roped in through the provision of land on 99-year lease by the panchayat at a token lease amount of Rs. 50 per acre. The panchayats providing land will get a 25 per cent reservation for the students from their respective villages. In case of schools with strength up to 2000 children, the government will bear 50 per cent of the capital expenses up to 7.5 crore while the operational costs will be shared between the government and school management on a 70:30 basis. In case the private operators enrol more than 2000 children, the additional recurring costs will be borne by them. The contract contains provisions regarding reneging of contract obligations by either party. Further, the management of these schools will have a two-tier structure at the State and school level.

Performance: Adarsh schools have shown positive performance in terms of attendance, retention and reduced drop-out rates. According to a World Bank report, "47 per cent of students in Bharti schools scored over 75 per cent in Cycle III of internal assessment and 74 per cent of students had more than 90 per cent attendance in March 2011."

DBFOT PPP Project in Rajasthan: This scheme being implemented under India Infrastructure Project Development Fund proposes the establishment of five schools per district (33 districts in all) and at the block level in rural areas. For this scheme, the private partner is required to pitch in with the entire capital cost and the state government will provide a capital incentive in instalments. Further, the state government will sponsor 50 per cent of the students in these schools and a part of the recurring cost for these sponsored students will be reimbursed through vouchers.

Rajasthan Education Initiative (Bharti Foundation): Under this initiative, the infrastructure and some amount of the infrastructure grant is provided by the government while the foundation takes care of the renovation and teachers' salaries while also handling daily operations. The MoU for the PPP is initially signed for a period of 10 years and will be extended on the basis of mutual consent.

Performance: This model has yielded good results in terms of enrolment, quality and provision of infrastructure. While 20 out of the 24 schools in Amer district got A and B grades in the Quality Assurance Test conducted by Sarva Shiksha Abhiyaan, the World Bank report on PPP in Secondary Education in India has highlighted the following achievements of these schools:

- 50 per cent increase in enrolment
- high 54:46 girl-to-boy ratio
- increase in access to drinking water from 34 to 57 schools
- increase in electricity connectivity from 3 to 49 schools
- school renovation and plumbing from nil to 49 schools and
- allocation of computers from nil to all 49 schools

This initiative is not without its challenges. The Government officials were sceptical and the community apprehensive about the financials to begin with. Infrastructural issues continue to plague these schools and paucity of operational funds leads to an unsustainable situation. The conflict between management and pre-existing teachers in the adopted schools is also a major challenge.

Vidyateerth PPP programme in Gujarat: This peri-greenfield model aims to provide urban amenities in rural areas under the 'Rurban' initiative. The programme plans to consolidate smaller schools so as to impart quality education in rural areas lying on the periphery of urban areas through a tri-partite agreement between the state government, public sector utilities (PSU) and private operators. While the government will provide teachers and reimburse approximately Rs. 11,000 on a per student basis; the PSUs will monitor the operations and provide infrastructure costs and other expenses. The private operators will provide the teacher training and curriculum. The programme is to be implemented across 255 locations; at present 35 partners have come on board and the agreements for 20 schools have been completed.

Mumbai PPP Framework: As can be seen in Table 1, the Municipal Corporation of Greater Mumbai (MCGM) has designed and implemented an elaborate PPP framework since 2013 with the aim of improving enrolment, attendance and quality of education for children from the deprived classes in municipal schools in Mumbai. The framework includes four approaches:

i. Full School Management with Private Teachers (School Management, FSMPT)
ii. Full School Management with MCGM Teachers (School Adoption, FSMMT)
iii. Specific Services Partnerships (SSP)
iv. School Input

This can be likened to the classification of PPP contracts by the World Bank Report (Table 1) but modified to suit the Indian context.

TABLE 1

Mumbai PPP Framework

Parameter	*Details*
Full School Management with Private Teacher (School Management, FSMPT)	Private partner manages an existing or new MCGM school with its own teachers and principal. Private operator has operational autonomy. E.g., Akanksha, 3.2.1, Muktangan, Aseema
Full School Management with MCGM Teachers (School Adoption, FSMMT)	MCGM allows the private player to manage an existing school while retaining teachers. The private player can provide training, materials, managerial inputs etc. E.g., Naandi
Specific Services Partnerships (SSP)	Private player provides specific services/inputs such as student competency assessment, teacher/principal training, remedial education etc. E.g., Naandi, Masoom
School Input	Private agency provides support through one-time donation of materials or services such as computers, furniture, one-time capacity building workshops for teachers etc. E.g., Rotary Club

Source: MCGM portal and FICCI report, 2014, pp 61

The School Adoption Model (Table 2) has met with limited success due to the inability of the government to find English medium teachers and the limited operational autonomy given to the private partner. The shortcomings of this model have highlighted the need for connecting the project with the requirements of the schools and the community while the government encourages the adoption of the programme inputs in the school. The role of teachers and school staff in changing mindsets is also of paramount importance.

Out of the four approaches, the School Management Model as shown in Table 3 is expected to produce the best outcomes as the private players have maximum flexibility in introducing innovative practices in the schools which they manage. These private operators are selected on the basis of stringent selection criteria and are required to meet certain predetermined performance standards, failing which the contract will not be renewed. However, this model faces some challenges with respect to financing. Since the government reimburses only 60 per cent of the per child costs at the existing rates, viability gap funding will be required for which the private operators have to depend on philanthropic funding –

such a model is not sustainable. Moreover, tying reimbursements to learning outcomes may not be an optimum measure of the school's performance as the private operators may provide false assessment reports; hence a more comprehensive criteria framework for assessing the school's performance is required.

TABLE 2

Full School Management with MCGM Teachers (School Adoption, FSMMT)

Parameter	*Details*
Overview	School Adoption Model (FSMMT). NGO places a facilitator in each school to provide whole school support. NGO has limited operational autonomy.
Objective	To provide high quality education to children from economically disadvantaged communities.
Coverage	Currently operating in 28 out of 71 English medium MCGM schools.
Financial Model	Reimbursed approximately 60 per cent to 70 per cent of its cost per child per annum by the government. Remainder is funded by donors.
Private Partner	Naandi Foundation

Source: FICCI report, 2014, pp 64

TABLE 3

Full School Management with Private Teachers (School Management, FSMPT)

Parameter	*Details*
Overview	Full school management. Located in existing school infrastructure. Private operator has full operational autonomy. Focus on learning outcomes.
Objective	To provide high quality education to children from the most economically disadvantaged communities through support from NGOs, foundations and private agencies
Coverage	20 schools in Mumbai currently operating
Financial Model	MCGM provides municipal school infrastructure. Schools could be reimbursed up to 60 per cent of MCGM's prevailing operating cost, based on performance in the scoring criteria after first year of operations. Private player incurs operational cost in the first year of operations.
Private Partners	Akanksha, 3.2.1 Educational Foundation, Muktangan, Aseema

Source: FICCI report, 2014, pp 62

NEP and PPP

i. The New Education Policy (NEP) 2020 has been formulated on the pillars of access, equity, quality, affordability, and accountability. The principles on which this Policy is based are flexibility; equity and inclusion; light but tight oversight and regulatory system to ensure integrity and transparency of the educational system; autonomy, good governance and empowerment to encourage innovation; etc. The Policy emphasises that education is a public service and access to quality education must be considered a fundamental right. Hence, *the policy calls for a strong, vibrant public education system as well as the facilitation of true philanthropic private participation.*

ii. In order to promote greater ease in building schools, enable alternative models of education like gurukulas, madarasas, and home schooling, as well as to incorporate local features pertaining to culture and demographics, *the policy lays more emphasis on output pertaining to learning outcomes rather than on inputs. To this end, philanthropic-public partnerships, public-private partnerships etc., will be promoted.*

iii. The provision of quality textbooks at low cost is sought to be achieved by using high-quality textbook materials developed by NCERT along with the SCERTs. In order to supplement this, *additional textbook materials are sought to be funded by PPPs that would enthuse experts to write high-quality textbooks at cost price.*

iv. *The policy aims at curbing the commercialisation of education and exploitation of parents and communities through transparent regulatory practices.* Both online and offline public disclosure and transparency is emphasised instead of fulfilling arbitrary mandates by the State School Standard Authority (SSSA).

v. *The private philanthropic efforts for quality education are sought to be encouraged by ensuring that assessment and accreditation of public schools and private schools have to meet the same criteria, benchmarks, and processes.* The asymmetry in regulation between public and private schools which has been detrimental to public-spirited private/philanthropic schools is sought to be set right through an effective quality self-regulation or accreditation system for all stages of education – pre-school to secondary school which it is hoped will lead to better compliance with essential quality standards.

vi. A *National Assessment Survey* will continue to be conducted by National Assessment Centre for School Education (NACSE) *in order to assess the learning levels of students in both government and private schools.*

vii. In order to encourage private philanthropic activity in the education sector, any *funds raised by a public institution through Development Offices and Alumni Associations etc, will not face as a consequence any cut in public funds.*

There are several provisions pertaining to PPP in higher educational institutions but have not been discussed here since they are not within the purview of this paper. The NEP thus has envisaged a major role for the private sector in developing the quality of education in India and has incorporated several administrative and financial measures in the Policy to this end. While the provisions in the NEP pertaining to PPP in education are ambitious and have been formulated with the noble objective of improving learning outcomes, the effective

implementation of the policy through efficient government oversight will be of paramount importance in achieving its objectives.

Recommendations

As mentioned earlier, enrolment rates in India are almost touching 100 per cent. However, in the post-pandemic era, the government schools and government aided schools have seen a sharp rise in intake while private schools and other schools have seen a fall in enrolment rates (UDISE, 2022: 23); this can be largely attributed to the lowering of income levels among the poor. This makes it exigent to upgrade the quality of education in public schools. Thus, along with the adoption of PPP model in education for schools which are going to be newly established, the reform of the existing public education system is a dire need.

In view of the analysis in the preceding sections, this paper makes the following recommendations regarding the adoption of PPP model in education in India.

TABLE 4

Proposed PPP Model in Education in India

Type Of School	*PPP Model (Type of Contracting)*
Existing Government schools	Professional services (teacher training, curriculum design, textbook delivery, quality assurance and supplemental services) – Input Infrastructure and building maintenance – Process
Government aided schools	School management (financial and human resources management) – Input Professional services (teacher training, curriculum design, textbook delivery, quality assurance and supplemental services) – Input Infrastructure and building maintenance – Process
Proposed PPP model schools	School management (financial and human resources management) – Input Professional services (teacher training, curriculum design, textbook delivery, quality assurance and supplemental services) – Input Infrastructure and building maintenance – Process
Private schools	Student places in private schools (by contracting with schools to enrol specific students) – Output

Source: Author's analysis

As can be seen from Table 4, there are four types of schools in the public education system which can adopt the PPP model in various formats depending on the situation.

Government schools: In the case of government schools which are already operating, the infrastructure and management are already in place and the schools are fully funded by the government. The government can provide support services like meals and transportation as also other items like uniforms, books, shoes etc., as mandated by the Right to Education (RTE) Act. Where they are lacking is in the *operational process and professional inputs.* As such, the government schools can enter into PPP contracts for providing infrastructure and building maintenance as well as specialised services like teacher training, curriculum design, etc. Better infrastructure will attract more students while professional inputs will enhance student learning.

Government aided schools: While these schools are funded largely by the government, their lack of accountability of teachers to the management acts as a hurdle in bettering their performance. Hence, these schools should be given *complete autonomy in their management.* Also, the grants given to them should be *tied to their performance.* This will increase competition among them for grants (covering non-salary recurring costs) and thus improve overall results. At the same time contracting out the *facilities management and professional services* will enhance the quality of the schools.

Proposed PPP Model Schools: As in the Akanksha model, the private sector will find it easy to start with elementary schools and then expand them into full-fledged secondary and higher secondary schools. The government can provide the private operator with the land and buildings and contract out the *school management (financial and human resources management), building maintenance, and professional services.* There can be some cost sharing with the private operators with respect to recurring and non-recurring costs. The government can provide support services like meals and transportation as also other items like uniforms, books, shoes etc., as mandated by the RTE Act. The management can be given full autonomy for operating the school and some pre-existing standards (teacher and student performance) can be specified for extension of contracts.

Private schools: These schools can be mandated to give admission to students funded by the government in order to fill the capacity gap in public education. This is already happening to some extent through the reservation mandated under RTE Act. The government is bound to reimburse the schools either on the basis of per-child expenditure borne by the state government or the fees charged by the private schools, whichever is lower. Though the RTE Act has succeeded in increasing enrolment rates, implementation hurdles remain with reference to rationalising the 25 per cent reservation system, execution of the non-detention policy, the rigorous rules pertaining to inputs, and the necessity to bring early childhood care and education within the purview of the Act, etc. (Bhattacharjee, 2019: 1). As such, distribution of vouchers to parents who can then select the school suited to their location and background can be one solution in this regard.

Conclusions

The importance of improving access, equity, and quality in education in developing countries cannot be emphasised enough. The Public Private Partnership (PPP) model of education is one solution to improve the quality of education in government schools.

The PPP model in education is a controversial subject with some studies suggesting that it will lead to increased discrimination of students with regard to income and academic achievements while no tangible improvement in academic achievement is seen. Some other studies have suggested that the benefits accruing from the use of vouchers is largely restricted to high-achieving students. Further, the selection criteria on which parents base their choice of school for their children may not be dependent only on academic achievement. Notwithstanding the above reservations regarding the PPP model, it has been observed that publicly financed education services which are privately contracted out for their actual provision not only leads to improvement in the quality of education but also substantially extends access to schooling, importantly for the marginalised section.

Endnotes

Vouchers and Subsidies

The voucher system is demand driven, and private schools run the risk of closure if they do not accommodate the required number of students. These schools are generally affiliated to particular sects; however, parents can choose between public and private schools or even among public schools. The entities providing funding and education services are distinct. Also, the private schools are bound by centrally defined performance standards. When the voucher system is targeted at particular sections like girls, it has shown to increase access, reduce inequality, and improve learning outcomes for them. Another form of targeted voucher system is to provide higher level of subsidies to schools catering to children from lower-income families.

Private Management and Operations

Contracting out in education can be done for various domains including management, financing, education services, professional services and facilities management. For example, the United States has primarily two types of privately operated public schools – managed schools and charter schools. In the case of the managed schools, Education Management Organisations (for profit firms) are allowed by the school districts to take over the management of failing public schools (being funded by the school districts) and in the case of charter schools, the management of public schools is contracted out to the private operators. The school management and school adoption systems being implemented in Mumbai is akin to these systems. While charter schools are similar to the voucher system in the provision of choice of school to parents, there are certain important differences between the two. The establishment and running of a charter school has to be approved by a government body whereas in the voucher system such permission is not explicitly required. The schools running under voucher system are generally seen to have religious affiliations; however, charter schools are prohibited from proselytising. Also, the performance of students from charter schools at state and central levels have to meet the established standards whereas the schools running under voucher system are not held accountable for the performance of their students.

Private sector involvement in building school infrastructure

In the case of private finance initiative (PFI) as seen in the United Kingdom, the PPP entails the construction and maintenance of infrastructure by the private operators so that the teaching staff and school management can focus on their key role of imparting education. The UK with 10 to 15 percent of its public sector capital investment routed through PFIs is the world leader in this respect.

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Is Online Teaching Effective? Perspectives of Teachers and Students in India

Polakshi Bhattacharyya Baruah*

Abstract

During the Covid pandemic, educational institutions were seen completely relying on the online mode of teaching. But the challenging part is: How well equipped are our educational institutions to impart online teaching? Are the teachers well trained for handling the technology for online teaching? These are some of the questions that arise when we rely on the online mode of teaching. This paper intends to answer some of these questions by conducting an online survey with the teachers and students of the higher institutions across the country, taking their views on reliability of and conformability with online mode of teaching. As the online teaching learning gained momentum, it was projected during the pandemic that it has come to coexist with the offline mode, and hence it is imperative to conduct researches to understand the efficacy of the online method of teaching.

The survey for the study was conducted online, and a sample of 152 teachers and 175 students responded to the online survey. The t-test was done on SPSS so as to determine the differences in the mean value of the two groups, namely teachers and students, on their opinion regarding as to how effective online teaching was in providing full information to the students. Results reveals that there was no significant difference in the mean value of the two groups. The data obtained on a 5-point Likert scale were interpreted by applying the bar diagram and cross tabulation methods. The descriptive analysis during the study revealed that the teachers were adapting more accurately designed technology for teaching purposes, like Zoom and Google classroom. It was also found that the number of students claiming themselves to be expert in handing technology is comparatively higher than the number of teachers. Factors like gender, followed by age and years of teaching experience of the teachers, are important factors that impact the online teaching

* Department of Economics, Assam Don Bosco University, Sonapur, Tepesia, Guwahati – 782402. Assam. Email: polakshibb@gmail.com

Introduction

The world needs to adapt itself to the changes, be the natural changes or man-made changes. Recently the experience of COVID-19 taught the world to adapt itself to the change in various ways. Considering the education sector, almost all the countries experienced a drastic change in the education process and the teaching learning methods. There is an evidence of increasing use of technology in the field of education, designed to keep the students engaged in the process of learning from their safe zone (Kumar et al, 2021).

The concept of online classes gained momentum after COVID -19 with increasing adaptation by the educational institutions across the world. However, successful implementation of this method of teaching depends on the availability of some technologies like internet connectivity, smartphone, and user-friendly apps of online teaching (Basar et al, 2021). Wildana et al (2020) pointed that the use of various apps like Whatsapp, Zoom and Google Classroom, etc., have been facilitating in making the online classes effective. However, studies also pointed out that their effectiveness depends a lot on the availability of internet facilities. Another study by Muhammad and Kainat (2020) discussed the problems associated in online classes, like lack of internet facilities or lack of interaction between teachers and students. According to a study conducted by Hazwani et al (2017), an institution's infrastructure plays a significant role in ensuring that online learning takes place successfully.

During the COVID-19 pandemic, universities across the world transitioned to online classes. A good deal of cooperation and understanding was required between the teachers and students for effective learning (Jowsey et al, 2020; Sandhu and Wolf, 2020). The impact of online classes on students in terms of their engagement, learning behavior thus became an important area of research for the researchers to provide important information for policy formulation regarding future readiness to the practice (Balas and Obeidat, 2020).

The focus on the evaluation pattern and the students' understanding of the concepts through the online classes during the COVID-19 have raised a number of questions to be answered through an evaluation of the online classes both in the short and the long term (Kumar et al (2021).

As online classes have become and shall continue to be a method of teaching and learning along with the offline mode, understanding the impact of this initiative in the teaching methods in terms of students' engagement, learning behavior and the level of adaptation of the technology among the teachers is the need of the hour.

Importance of Technology in Education

Studies like Bratton-Jeffery, Hoffman and Jeffery (2007) and Richey, Morrison and Foxon (2007) emphasise the role of technology in imparting knowledge. These studies argue that traditional methods of teaching need to be replaced by integrated learning and experiential learning with greater implementation of technology. In this period of Covid 19 pandemic, technology has acted as the driving force that maintains the connection between teachers and students without a classroom. Ghavifekr, Afshari and Amla Salleh (2012) stressed that in this 21th century technology is an important issue in the field of education and it has become an important means of transferring knowledge. The study emphasises the integration of Information and Communication Technology courses in the school curriculum.

During this period of lockdown, the University Grants Commission too directed all the higher education institutions of India to continue the teaching-learning process by adopting the available technology as per the convenience of the institutions. These guidelines were issued by the University Grants Commission in April 2020 whereas the Ministry of Human Resource Development and the University Grants Commission have issued certain guidelines to impart online education to the students by using online modes likes Google Classroom, Google Hangout, Cisco Webex Meeting, YouTube Streaming and Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM), etc. The authority has also issued certain guidelines for changes in the academic calendar of 2020-21 and in the mode of conducting of examination for the final semester students and promotion of other semesters students on the basis of previous year performances. But the question that arises here is: How equipped the institutions are to conduct online classes? Are the students able to access the online classes from remote areas? Is the teacher expertised in handling the technology? These are some of the questions that arise when we completely rely on online mode of teaching. This paper intends to answer some of these questions by conducting an online survey with the teachers and students of the higher institutions across the country by taking their views on reliability and conformability with online mode of teaching.

Objectives

This study intends to explore the adaptability of the teacher to the online mode of teaching. It also aims to analyse the views of the students on their adaptability to online teaching. Lastly, the study also intends to make a comparative analysis on the opinion of teachers and students on online teaching-learning practice during the pandemic.

Methodology

Data for the study were collected through an online survey of teachers and students across the country on Google form. The number of teachers' respondents was 152 and student respondents was 175; they gave their responses on the Google form. A t-test was run on SPSS to determine the differences in the means value of the two groups namely teacher and student on their opinion regarding how effective is online teaching in providing full information to the students. The data collected were mainly analyzed by adopting the tabular method and bar or pie diagrams. A 5-point Likert scale, with options like strongly agree (point 5), agree (point 4), undecided (point 3), disagree (point 2), and strongly disagree (point 1) was adopted to measure the opinion of the respondents on the various questions put forward to them relating to their experience with online teaching-learning during the pandemic period. Cronbach's alpha reliability test was run to test the reliability of the data.

literature Review

The use of technology has always emphasised on its role in imparting knowledge even before the outbreak of the pandemic. But the difference is that during the pandemic the process of teaching-learning methods went completely online and the dependency and requirement of technology increased during the pandemic. Various studies had advocated

the importance of technology in the teaching-learning process even before the outbreak of the pandemic, and analysed the factors that hinder the adaptation of technology in the field of education. The present study tried to highlight some of those studies which have stressed the importance of technology to be used as a tool of teaching-learning even before the pandemic.

Thompson and Lynch (2003), Anduwa-Ogiegbaen and Isah (2005), Gerlich (2005) and George Zhou (2007) have compared the confidence and ability of the male and female teachers to adapt technology. The findings of these studies reveal that females were found to be comparatively less confident in adapting new technology. These studies also claimed that male and female faculty members may approach technology through different routes. Males tend to pick up technology first and then consider its application in teaching, whereas females put greater emphasis on pedagogy than technology.

Roshelle et al (2000), in their study, tried to explore the role of technology in distance learning. In the distance learning mode, the teacher and the student may never meet each other as all the tasks of imparting knowledge is done online by using various techniques. The study pointed out that distance learning puts pressure on the teachers as they need to redesign their teaching methods to suit the need of the students and it is also challenging for the teacher to use the technology effectively. It emphasised proper training of the teacher to use the technology which is an indispensable part of the distance mode of teaching-learning. Some studies like Andrew (2003) and Usher (2012) agreed with the study of Roshelle et al (2000) which found that using technology sometimes might be challenging for the teachers. However, they stressed the point that technology promotes self-learning habits among the students as they can narrate what is learned with the real-world situation with the use of technology. Ernst and Moye (2013), in their study, tried to examine the role of technology in the life of children with some economic and physical constraints. The study noted that students with specific at-risk indicators (such as a disability, economic disadvantage, or who are second language English speakers) were more likely to have difficulties in learning and feel isolated. To counter the feelings of isolation, the study proposed that a technology education classroom may help alleviate and remedy these problems. This classroom would offer the opportunity to learn communication and socialisation skills in a controlled environment that the students are familiar with, which may not be the case in other standard classrooms. It was concluded that students with at-risk factors are more likely to have their emotional needs met and an increased social interaction when exposed to technology integration in the classroom. Although most of the studies agreed that technology has been playing an important role in education, but at the same time it has studied have also pointed certain inconvenience caused by use of technology in the teaching-learning process. The study carried out by Thomas O'Bannon and Bolton (2013) stated that the most of the teacher find the use of a smart phone in the classroom a disturbing factor in maintaining the classroom discipline, as the students sometimes misuse the technology. Berry and Westfall (2017) agreed with the finding of Thomas, O'Bannon, and Bolton (2013) that the use of cellphone in the classroom create disruption even if the communication is non-verbal.

Again, it should be noted that the merit and demerit of technology depends a lot on the nature of adaptability of the teachers and students to certain technology and their skill in handling them. Some of the literature highlighted the level of effectiveness among the teachers and students in using the technology confidently — like Gray and Lewis (2010)

designed a study to find the level of use of technology among the teachers. It was found that despite the open access to technology, 69 per cent teachers use the technology on a consistent basis, out of this 40 per cent used the technology" often" and 29 per cent used it sometimes. This indicates that despite the easy accessibility the utilization of technology is not up to the mark, the study stressed the need to develop the culture of using technology among the teacher to bring the process of blended learning into practice. Another study by Sung Youl Park (2009) found that although the number of universities and colleges using electronic learning is increasing, there is still a doubt in the level of adaptability of the students to this system of electronic learning. This study pointed out that affordability and accessibility of technology are the two determining factors of adaptability. Another study by Zimlich (2015) pointed out that the successful implementation of technology in education is not determined by the quantity of technology in the classroom but the determining factor is the quality of the specific use of the technology by the teacher that put a deep impact on the mind of the students. This study also like the other studies of Gray and Lewis (2010) and Sung Youl Park (2009), stressed proper training of the teachers on using the technology to impart knowledge.

During the pandemic when most educational institutions were completely relying on the online mode of communication, they were very uncertain about how long they had to rely on it. This situation opened an area where more research was directed toward the challenges and opportunities of online teaching, possible future changes in the teaching-learning process where technology might play even more role than now, and the various obstacle faced by the user of technology in different geographical locations. The study of L. Ashar (2020) focusses on the possibility of future changes that might occur in teaching methods. The study stated that there is a great shift in the way of imparting education during the Covid 19 pandemic. It stressed that greater implementation of technology will empower the future education system of the country so that it can prepare itself to meet any future crisis of this kind with the least possible negative impact on the education system. Sintema (2020) focused on the impact of covid 19 on the students who could not access online teaching due to certain economic and geographical factors. The study found that the academic performance of the students had dropped due to reduction in the face-to-face contact between teachers and students and/or non-availability of the technology to avail the online mode of teaching. However, the study also admitted that the role of technology in education cannot be ignored in the near future as it provides the best platform to empower the learning process in the crisis of pandemics.

Along with the importance of adapting to the technology for online teaching and learning the quality of knowledge imparted and the rate of plagiarism is another important issue need to be addressed by the research studies. Some studies like United Nation (2020) has already raised concern about the quality of the online examination conducted by a various educational institution as per the convenience and expertise of the educators and the compatibility of the learners. The study pointed out that appropriate measures to check plagiarism are yet to be put in place in many schools and institutions, mainly due to their large student populations.

Most of the existing literature reveals the role of technology in education in the presence of a classroom, but in the present situation during a lockdown, the process of imparting knowledge is completely depended on technology without any classroom, and very few studies have been done so far to measure the effectiveness of online teaching as the only

mode of imparting knowledge. This study aims to fill the gap in the existing literature by focusing on the pros and cons of imparting online education by depending on certain teaching-learning apps during this period of the pandemic.

Findings and Discussion

At the very outset, the study conducted a t-test to make a comparison between the means of the two sets of samples collected. The hypotheses were

H_0 The means of the teacher group = the means of the student's group

H_a The means of the teacher group ≠ the means of the students' group

The purpose of this test is to determine whether the opinion of the teachers and the students with regards to the possibility of delivering full information to the students on the online mode of teaching, is significantly different in our database.

TABLE 1

Result of T-Test

Group	*Number of Respondents*	*Mean*	*Std. Deviation*	*Std. Error Mean*
Teacher	172	2.90	1.148	.088
Student	152	2.72	1.124	.091

The result of the t-test as shown in Table 1 reveals that there is no significant difference in the mean value of the two groups (teachers and students) regarding their opinions about effectiveness of online teaching in providing full information to the students.

The value of the Cronbach's Alpha shows that the data is reliable for analysis as the value of the test is .751 it implies that it is acceptable, as the value is more than 0.7 (Taber, 2018).

Reliability Statistics

Cronbach's Alpha	*No of Items*
.751	19

Brief Descriptive Statistics of the Sampled Teachers

Tables 2 below shows the descriptive statistics of the sample, who responded to the questions on Google Form relating to this study. The responses were collected from both the teacher and students relating to their opinion on various issues of online teaching during the lockdown.

TABLE 2

Descriptive Statistic Relating to Teachers

Gender	*No of Respondents*	*Age Group*	*No of Respondents*	*Years of Teaching Experience*	*No of Respondent*
Male teacher	43.4 per cent	Age less than 30	4.6 per cent	Less than 1 year	2.1 per cent
Female teacher	56.6 per cent	Between 31-50	74.3 per cent	1 year to 5 years	13.2 per cent
Total	152	Above 50 years	21.1 per cent	6 years to 10 years	20.4 per cent
-----	----	------	-----	11 years and above	64.5 per cent

Table 2 reveals that the total number of responses that we received from teachers across the country is 152, out of this 43.3 percentage are male respondents and 56.6 per cent are female respondents. Looking at the age of the respondents it reveals that the majority of the respondents (74.3 per cent) are in the age group of 31- 50 years, 21.1 per cent are in the age group of above 50 years and only 4.6 per cent are in the age group of fewer than 30 years. The majority of the respondents (64.5 per cent) have more than 11 years of teaching experience.

Gender-Wise Distribution of Respondents according to the Digital Platform

Gender happens to be an important determinant in most fields of research. In the field of education too, gender is considered to be a dominant factor having a significant impact on the teaching-learning outcome. This study also tried to find the role of gender in adapting the new technology of online teaching.

Table 3 below reveals that a number of the teachers, both male teachers (34.4 per cent) and female teachers (47.7 per cent), used Zoom Or YouTube as a medium of online teaching. It seems that about 15.2 per cent of male faculty used it but compared to it only 8.1 per cent of the female teachers used it. It also showed more female teachers used the Microsoft team compared to the male teachers. The category Others included tools like WhatsApp, email, message, phone calls, etc. Here the percentage of both male and female teacher is low, compared to other tools. It reveals that the teachers are switching from regular technology like What'sApp, email, etc. to more accurately designed technology for teaching purposes, like the Zoom and Google Classroom.

TABLE 3

Gender –Wise Distribution of Respondents According to the Digital Platform Used for Online Teaching

Gender	*What Digital Platforms Did You Use to Conduct Online Classes?*					*Total*
	Zoom	*Google Classroom*	*You Tube*	*Microsoft*	*Others*	
Male	36.4 per cent	28.8 per cent	15.2 per cent	9.1 per cent	10.6 per cent	100 per cent
Female	47.7 per cent	25.6 per cent	8.1 per cent	11.6 per cent	7.0 per cent	100 per cent
Total	42.8 per cent	27.0 per cent	11.2 per cent	10.5 per cent	8.6 per cent	100 per cent

Skill of Handling Technology and Teachers' Experience with It

To adapt and handle a new technology depends on the capability of the individual to learn the technology, this study have classified the respondent as expert, beginner and learner on the basis of their knowledge about the technology. Those who are aware and have used the technology even before the pandemic were classified as experts; those who are aware of the technology but were using it only during the pandemic are classified as beginners, and those who are totally new to the technology and struggling to handle it were classified as learners.

The information given in Table 4 reveals that a number of the teachers, both male teachers and female teachers, are at the beginners stage. About 48.5 per cent of male and 40.7 percentage of female teachers stated that they are at the beginners stage. It was also observed that a number of the female teachers, about 46.5 per cent of them, admitted that they were in the learning stage. Some of them, 18.2 per cent of male and 12.8 per cent of female faculty, ranked themselves as experts in handling the technology for online teaching.

TABLE 4

Gender-Wise Distribution of Respondents according to Their Skill in Using Technology for Online Teaching

Gender	*How Would You Like to Place Yourself Regarding the Skills for Online Education/ Teaching?*			*Total*
	Experts	*Beginners*	*Learners*	
Male	18.2 per cent	48.5 per cent	33.3 per cent	100 per cent
Female	12.8 per cent	40.7 per cent	46.5 per cent	100 per cent
Total	15.1 per cent	44.1 per cent	40.8 per cent	100 per cent

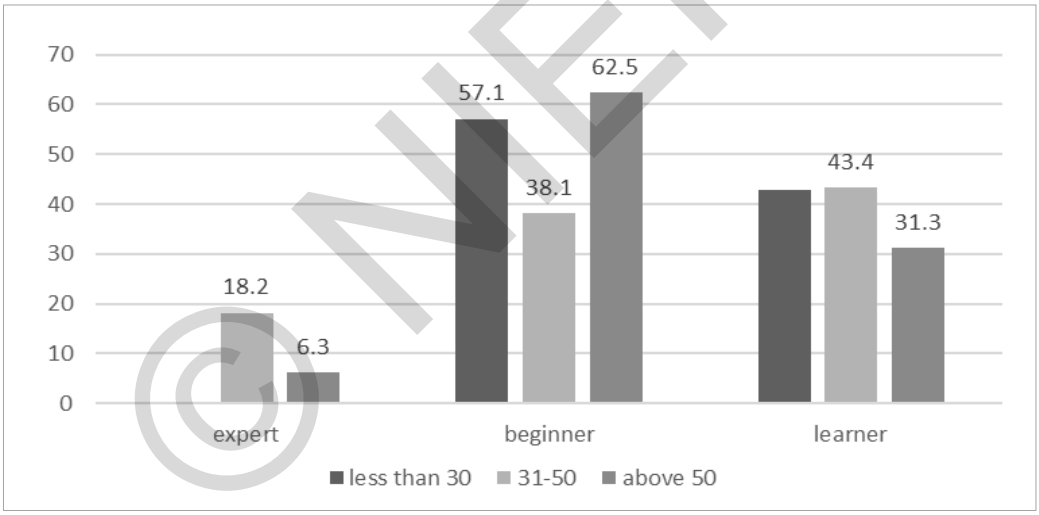
Does the Age of Teachers Have Any Impact on Their Learning the Skill of Handling the Technology for Online Classes?

It is well understood that about learning a new skill, the age of an individual plays an important role. So, the present study also tried to highlight the relation between age and learning skill among the teachers.

Figure 1 below shows the age of the teachers and their skills in handling technology. It found that the teachers less than 30 years of age, around 57.1 per cent of them, are mostly at the beginner stage, and 62.5 per cent of teachers above the age of 50 are also at the beginner stage, 38.1 per cent of teachers who are of the age between 31 to 50 also admitted that they are at the stage of the beginner. Very few of them from the age group of 31-50 and above 50 are in the stage of an expert with technical skill. Most of the teachers from all age groups are in the learning stage of using technology to conduct classes online. So it reveals that it needs some time and experience for the teachers to become an expert in the skill to use technology for teaching online.

FIGURE 1

Age-Wise Distribution of Respondents and Their Skill in Handling the Technology



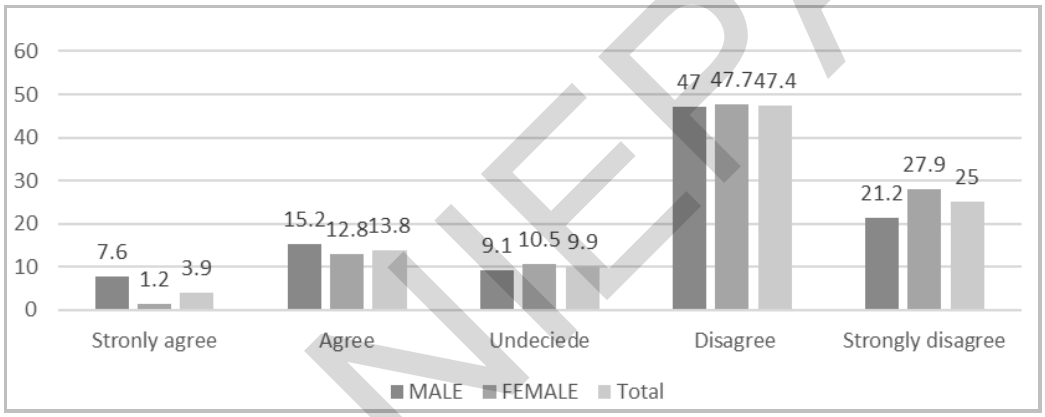
Gender of Teachers and Their Opinions on Time Focus of Research during a Lockdown

Studies like Queisser et al (2020), Farré et al (2020), and Sevilla and Smith (2020) had their focus on household work and the burden on working women during COVID-19. These studies revealed that due to increased housework and childcare resulting from the closing of schools and nurseries many women are already struggling to balance between household work and office work.

The information in Figure 2 shows the responses when asked whether they get enough time for research during a lockdown, reveals that about 47.0 per cent of the male teacher and around 47.0 per cent female disagree and the percentage of male and female teachers who strongly disagree with this is 21.2 and 27.9 respectively. The percentage of teachers who strongly agree with the fact that they could do some research work is comparatively low only 7.6 and 1.2 per cent of males and females respectively. It can be stated that the percentage of female teachers who disagree is more than the percentage of males. The present study also admits the point that it might be because the female teachers get less time to concentrate on research work as time management for work from home and household tasks both together is difficult for some female.

FIGURE 2

Gender-Wise Distribution of Respondents According to Their Opinion On Time for Research Work During a Lockdown



Various Tools or Platforms Used by Teachers for Online Classes as per the Teachers' Stage of Adopting the Technology

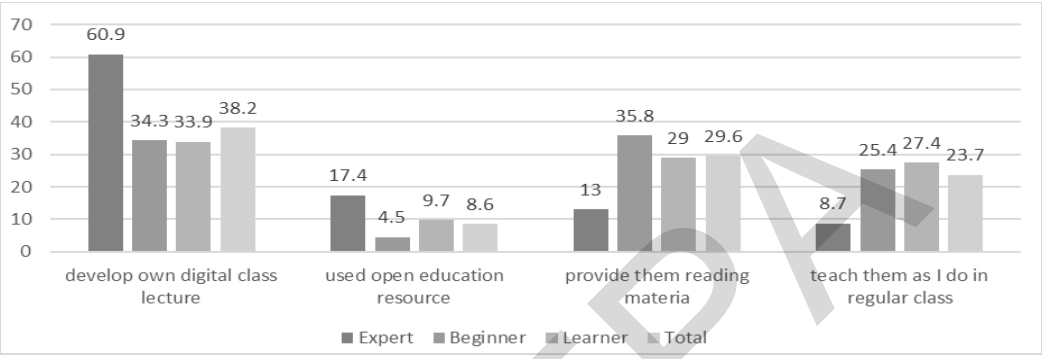
Having a skill and applying it in practice might vary among the skilled persons. Our study attempted to find if there is any difference among the teachers in applying their knowledge of technology in designing their classes.

Figure 3 reveals the relationship between the technical skill of the teachers and how they design their online classes. It is observed that the teachers who are expert in technology skill they develop their own digital class lecture (like lecture video, PPT, used the white board in Zoom and Google Classroom). Around 60.9 per cent of the expert teacher stated that they develop their own digital class. The teachers who are at the stage of a beginner or a learner also develop their own digital class but their percentage is almost half compared to the percentage of the expert. The beginners and learners mostly provide the study materials online to the students (in Google Classroom, WhatsApp, email) some of the teachers who are the beginner (25.4 per cent) and learners (27.4 per cent) take the class as they do in normal

class (like provide the students with notes, give them an assignment and take a test on Google classroom).

FIGURE 3

Distribution Of Respondents Based on Their Technical Skill And Designing Their Online Classes



Teachers' Opinions on Exploring More Technology during Lockdown

The following paragraph is devoted to a discussion of the teachers' opinion regarding their exposure to a new technology during the pandemic, and it also tries to highlight if there is any variation in their opinion in terms of their age.

FIGURE 4

Distribution Of Respondents' Age-Wise and Their Opinion On Exploring More Technology During Lockdown

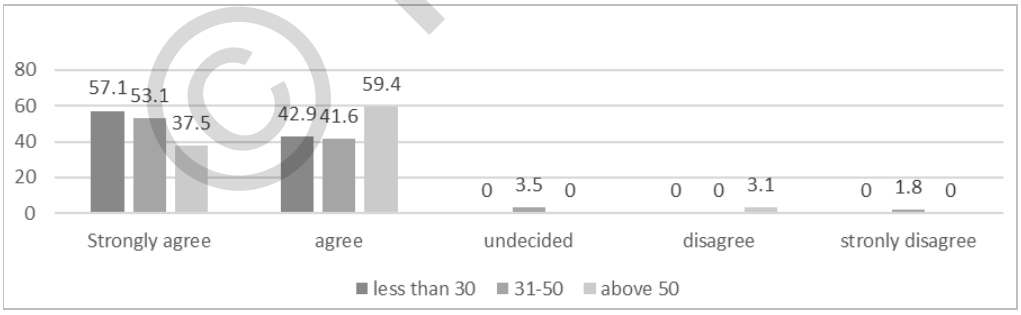


Figure 4 reveals that a majority of the teachers, irrespective of their age, strongly agree that during the lockdown, since they had to take online classes, they got an opportunity to explore some new technology and learn new things to make their online classes comfortable and interesting for the students. It is evident from Figure 4 above that the percentage of the teachers who do not agree with this view is very negligible compared to the percentage of

teachers to agree that they got an opportunity to explore new technology during the lockdown.

Distribution of Teachers according to Their Skill in Handling Technology and Time Devoted to Research during Lockdown

It is accepted that having a skill in technology can save the time of the person concerned. This study also tried to find out if the teachers, by using technology, could save their time inn teaching and devote more time to research during this pandemic.

TABLE 5

Distribution of Teachers according to Their Skill in Handling Technology and Time Devoted to Research during Lockdown: A Cross-Tabulation

How Would You Like to Place Yourself Regarding the Skills for Online Teaching?	*Lockdown Has Given Teachers Enough Time to Focus on Research*					*Total*
	Strongly Agree	*Agree*	*Undecided*	*Disagree*	*Strongly Disagree*	
Expert	47.8 per cent	26.1 per cent	8.7 per cent	13.0 per cent	4.3 per cent	100 per cent
Beginner	13.4 per cent	43.3 per cent	6.0 per cent	26.9 per cent	10.4 per cent	100 per cent
Learner	16.1 per cent	56.5 per cent	8.1 per cent	19.4 per cent	0.0 per cent	100 per cent
Total	19.7 per cent	46.1 per cent	7.2 per cent	21.7 per cent	5.3 per cent	100 per cent

Above Table 5 shows the relationship between the level of technical skill and the time to focus on research during the lockdown period. The table reveals that teachers (47.8 per cent) who are experts in technology, strongly agree that they could manage time for research during the lockdown. The teachers who are at the beginner and learner stage though did not strongly agree but do agree that lockdown has given them time to focus on research and their percentages are 43.3 per cent and 56.5 per cent respectively. The percentage of teachers who disagree and strongly disagree is very less compared to the teachers (expert, beginner, and learner) who agree to the point that lockdown has helped them to focus on research work.

Descriptive Statistics of the Students Sample

A total of 175 students responded to the Google Form to provide information on their experience regarding the teaching-learning process in the online mode during the lockdown

period. The following paragraph presents a picture of the responses of the students which is mainly analysed by using the tabular method. Table 6 reveals that the majority of the respondents are female students around 65.1 per cent, and the age of the respondents shows that most of the students are of the age between 18 -22 years old.

TABLE 6

Descriptive Statistics of the Sample of Students Respondents

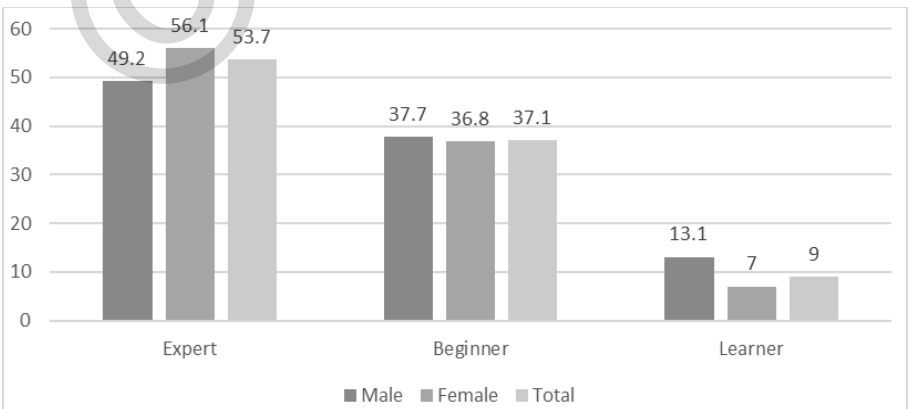
Gender	
Male	34.9 per cent
Female	65.1 per cent
Age Of the Respondents	
Less than 18 years	11.4 per cent
18-22 years	57.1 per cent
23-25 years	26.9 per cent
Above 26 years	4.6 per cent

Students' Gender Profile and Their Skill in Handling Technology

Figure 5 below shows that most of the students, both male and female, claimed that they might be ranked as experts in term of their skill in using technology in the teaching-learning process. About 56 per cent of the female and 49 per cent of the male students ranked themselves as experts. However, a sizeable number of students, nearly 37.7 per cent male and 36.8 per cent female students, stated that they are at the beginners stage in handling the technology. It is encouraging to find that only a few students were at the learners stage, and if given more exposure to technology they too can upgrade themselves to experts in a short span of time.

FIGURE 5

Distribution of Respondents According to Their Skill Handling Technology Chart Title



Conclusion

It is by now acceptable that e-learning tools have played a crucial role in shifting of the face-to-face teaching to a virtual mode of teaching in a very short span of time. Studies like Subedi (2020) and Petrie (2020) have admitted the crucial role of e-learning tools in digitalising the education system but pointed out that the best method of teaching /learning in an online mode yet needs to be improved a lot so as to meet the need of the students as well as teachers. The present study has found that there is a need for proper training for the teachers of age above 50 years in handling the modern and new technology, to make their lectures as effective as it usually used to be in offline mode of teaching. However, the students in this regard were found to be more expert in handling the technology compared to the teachers, and the reason might be the age of the respondent, as at an younger age the adaptability to a new system takes less time compared to the older age. With regard to the online evaluation process, teachers expressed their dissatisfaction, stating that if students do not take the online exams seriously then the scores of their exams are not a true reflection of their understanding of the subject. Hence, there is a need for further exploration to innovate more transparent method of online assessment and online evaluation method.

As pointed out by Murgatrotd (2020), the biggest challenges of e-learning are accessibility, affordability, flexibility, and learning pedagogy. As there is a high possibility that e-learning will continue in a parallel manner with offline teaching, there will arise a need to address the challenges, especially the issues of accessibility and affordability of the technology. The policy level intervention has to play a vital, to bring certain changes in the education system keeping in mind the present need of the country as well as global needs. It should focus more on investing in professional training of the teachers in the field of information and communication technology, and effective pedagogy, so as to make the education system prepared for any such uncertainties in the future.

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Utilisation of Scholarship Schemes for Higher Education: A Study of Two Central Schemes

Ankita Singh*
Santwana G. Mishra#

Abstract

Higher education plays a crucial role in nation-building by providing individuals with the skills needed for societal progress. However, financial limitations and the need to work often hinder access to higher education. In the context of globalisation and privatisation, governments use scholarships to alleviate students' financial burdens. Despite their availability, many students do not take advantage of these opportunities. This paper focusses on two of the central government's scholarship programmes in India, emphasising the fresh and renewal utilisation rates, state effectiveness, and scheme characteristics. It utilises the data collected from the National Scholarship Portal, concentrating on two central government scholarship schemes: the Post-Matric Scholarship and the Merit cum Means Scholarship Scheme. The selection is based on data availability and the central government's prominent role in sponsoring education scholarships. The findings reveal that stringent merit criteria, low awareness, inadequate scholarship funds, and renewal criteria contribute to lower renewal utilisation rates. Consequently, the study proposes revising scholarship amounts and criteria, increasing awareness, and promoting knowledge exchange between high-performing and struggling states to improve overall utilisation rates.

* National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi-110016. Email: ankita@niepa.ac.in

National Institute of Educational Planning and Administration, 17-B, Sri Aurobindo Marg, New Delhi-110016. Email: santwana@niepa.ac.in

Introduction

A scholarship scheme is one of the government mechanisms aimed at subsidising higher education for students who have both social and financial need or exceptional academic or extracurricular talents. In India, the scholarship schemes can be categorised into three types: Means, Merit, and Means cum Merit. The means-based scholarships are provided to students based on their socio-economic background, while the central government offers a range of scholarship schemes to cater to various interest groups. In India, eligibility for these scholarships is determined by indicators such as caste, religion, ethnicity, and the occupational identity of parents, with family income serving as a fixed criterion. On the other hand, merit-based scholarships are awarded to students based on their academic or sports performance, with the primary goal of attracting students who exhibit exceptional talents into higher education. However, concerns have been raised regarding the necessity of merit-based scholarship programmes in a country like India, where access to higher education is often hindered by financial constraints.

The means cum merit scholarships are intended for meritorious students from underprivileged sections of society, with the objective of not only recognising their academic achievements but also encouraging them to pursue higher education by providing financial assistance.

In India, the government offers a wide range of scholarship schemes aimed at assisting various underprivileged sections of society. Moreover, there has been a significant increase in the budgetary allocation of the central government for scholarship schemes. India has witnessed a substantial growth in its budget for scholarships in education since 2003-04, with an increase from 7.6 million to 23,270 million in 2014-15 (Narayan, 2018). A study conducted by M.R. Narayan unveiled that in the fiscal year 2003-04, the central government's allocation for scholarship expenditure accounted for 2.97 per cent only of the overall expenditure, which was distributed among states, the central government, and Union Territories. By the fiscal year 2014-15, the central government's portion of scholarship expenditure had surged by 80 per cent relative to the total expenditure shared among states, the central government, and Union Territories. These scholarship schemes by central government for higher education are implemented through various ministries and are fully funded by the central government. Additionally, schemes with a large number of seats are divided among the states and union territory based on the population within specific age groups.

Several studies have argued that scholarship schemes contribute to increased enrollment in higher education, regardless of whether they are need-based or merit-based (Agasisti, Bratti, & Minaya, 2021; Baum, et al., 2021; Doyle, 2010; Dynarski, 2003). Moreover, scholarship schemes alleviate the financial burdens faced by students from disadvantaged backgrounds and serve as a motivating factor for their pursuit of higher education. In a study titled "The nexus between scholarship programs and higher education" in 2021, it was discovered that scholarships provided by non-government sources for higher education have a positive impact on various dimensions, including the personal, financial, research and collaboration, motivational and promotional, and intangible dimensions (Rana, Al Mamun, Hossain, & Rekha, 2021). However, these scholarship schemes were found to have an insignificant impact on the career and educational dimensions. The aforementioned article argues that scholarships assist students in efficiently pursuing their higher education

while they are receiving the scholarship, but it does not guarantee that beneficiaries will pursue further degrees once the scholarship get over. Similarly, receiving a scholarship does not ensure employment for the scholarship recipient.

In India, the central government offers numerous scholarship schemes through various ministries to cater to different interest groups. Since 2014, the National Scholarship Portal (NSP) has been utilised for online applications, verification procedures and amount disbursement of these schemes. Evaluating the performance of these schemes requires assessing the utilisation of seats, which is a crucial component. Seat utilization refers to the ratio of the number of fresh beneficiaries of the scheme to the total number of seats allotted for the scholarship in a given year. However, the utilisation of scholarship scheme seats in India has consistently remained low, as indicated by various reports (Minsitry of Social Justice and Empowerment, 2018; Institute of Economic Growth, 2020; Khatri, Gidwani, Atrey, Gupta, & Dua, 2023; Nayak, 2020). One common reason for the low utilisation rate, highlighted in several evaluation reports, is the lack of awareness about scholarship schemes and online procedure and lack of coordination between state and central nodal officer (Institute of Economic Growth, 2020; Nayak, 2020; Radhakrishnan, Pillai, Bhavani, Gutjahr, & Nedungadi, 2018). In a 2020 evaluation report by the Institute of Economic Growth, it was observed that the utilisation pattern of the schemes declined after the implementation of the online procedure through the NSP portal. Nonetheless, since 2016, there has been a gradual increase in the utilisation pattern.

Renewal utilisation rate in the context of scholarship schemes refers to the ratio of the number of beneficiaries enrolled in the current year for renewal to the number of beneficiaries in the previous year. This metric provides insights into the effectiveness of the scholarship scheme in facilitating continued access to higher education. The renewal utilisation rate serves as an indicator of the percentage of students who are able to maintain their enrollment in higher education. Numerous research studies on scholarship schemes have argued that scholarship recipients tend to have higher retention rates compared to non-scholarship holders (Zacharias, et al., 2021; Monks, 2009; Navarra Madsena, Balesb, & Hyndsc, 2010; Nocito-Gobel, Carnasciali, & Martinez, Georgia, 2000). The renewal rate of a scholarship scheme is also heavily influenced by the eligibility criteria set for its renewal. In the paper titled "When Need Meets Merit: The Effect of Increasing Merit Requirements in Need-Based Student Aid" it is seen that stringent renewal eligibility criteria in need-based scholarship schemes can result in an "equity-efficiency trade-off" (Agasisti, Bratti, & Minaya, 2021). This implies that if a scholarship scheme prioritises efficiency excessively, it may inadvertently favor certain groups or individuals who are already advantaged, thereby neglecting the principles of fairness and equal opportunity. Such an approach can led to situations where deserving candidates from disadvantaged backgrounds are overlooked, perpetuating inequality and limiting social mobility.

This paper focusses on an analysis of the utilisation of two distinct scholarship schemes, namely means-based scholarships and means-cum-merit based scholarships. The means-based scholarship schemes are characterised by selection criteria based on the income threshold of the students' families or their affiliation with specific minority groups. On the other hand, means-cum-merit based scholarships incorporate the same criteria as means-based scholarships, but also require students to meet certain merit-based eligibility criteria. The selection of these two scholarship schemes has been made with the aim of understanding their respective utilisation rates.

Existing research on student loans suggests that students from disadvantaged communities and backgrounds often face greater financial burdens compared to their privileged counterparts (Jackson & Callender, 2005; Adrews, 1999). Consequently, means-based scholarships play a crucial role in enabling students from disadvantaged backgrounds to access higher education. In contrast, students from privileged backgrounds have a range of options available to them, such as their own household capital, student loans and merit scholarships, which facilitate their pursuit of higher education. Therefore, by examining the utilisation and performance of means-based and means-cum-merit based scholarships, this study seeks to gain insights into their efficacy in addressing the needs of different student populations.

The paper aims to achieve three primary objectives. Firstly, it seeks to examine the disparities in the characteristics of two distinct scholarship schemes and their impact on the utilisation rates. Secondly, it aims to analyse the utilisation trends over a span of five years, from 2016 to 2021. Third, the performance of the states in utilising scholarship schemes is evaluated. The scholarship schemes investigated in this study are Post-Matric Scholarship for students belonging to minority communities and Merit-cum-Means scholarship for professional and technical courses both by the Ministry of Minority Affairs. To accomplish the research objectives, the paper relies on secondary data obtained from the national scholarship portal.

Methodology

The research methodology is of utmost importance for this paper as it provides a structured and systematic approach to examine the selected central government scholarship schemes. By employing quantitative research methods such as descriptive analysis and comparison analysis, the study can gain valuable insights into the fresh and renewal utilisation rates, characteristics, and all-India averages of the schemes. The methodology ensures the data is comprehensively analysed, enabling a robust interpretation of the underlying dynamics and effectiveness of scholarship schemes for higher education. This approach enhances the credibility and reliability of the findings, contributing to a well-founded and impactful research paper.

Selection of Scholarship Schemes

The primary focus of this study is to examine two specific scholarship schemes provided by the central government: the Post Matric Scholarship Scheme for Minority Communities and the Merit cum Means Scholarship Scheme for Professional and Technical Education CS[1]. (In the name of Merit cum Means Scholarship for Professional and Technical Education CS, CS stands for the central government.) These schemes were chosen for several reasons. Firstly, the study exclusively considered central government scholarship schemes due to their high share of expenditure on scholarship programme. The fact that the central government share of expenditure on scholarship program is 80 per cent of from total expenditure by government including central, states and UTs makes it a pertinent area for

[1] The name of Merit cum Means Scholarship for Professional and Technical Education CS in that The CS stands for Central Government.

research. Secondly, the selection of these particular scholarship schemes was based on the availability of data on the National Scholarship Portal (NSP). The NSP serves as a crucial platform that provides the necessary data required for comprehensive analysis. Thirdly, the study specifically chose scholarship schemes that allocate seats based on state/UT-wise distribution. This criterion was employed to ensure a diverse representation of geographical regions, allowing for a more comprehensive analysis of the data. Lastly, to ensure clarity and better data interpretation, the study focussed solely on scholarship schemes from one ministry that is Ministry of Minority Affairs. Both the Post Matric Scholarship Scheme for Minority Communities and the Merit cum Means Scholarship Scheme for Technical Education fulfilled all three aforementioned criteria, making them appropriate choices for data interpretation and analysis. By focusing on these central government scholarship schemes and employing these selection criteria, the study aims to provide a comprehensive analysis and understanding of the underlying dynamics of scholarship schemes for higher education.

Data Source

The study is based on secondary data obtained from various government websites, with the primary source being the National Scholarship Portal (NSP). The NSP is a crucial repository of data related to scholarship schemes, providing a comprehensive database of applicants and beneficiaries. Data collected from the NSP offers an extensive and reliable dataset for analysis.

Data Collection Period and Coverage

The database chosen for this study spans the period from 2016 to 2021, allowing for a five-year analysis of trends and patterns. This timeframe provides sufficient data to observe changes and developments over time. The data covers all states and union territories of India, ensuring a comprehensive representation of the country's scholarship utilisation patterns.

Quantitative Research Methods

To analyse the collected data, this study employs two quantitative research methods:

- **Descriptive Analysis**: Descriptive analysis is used to understand the fresh and renewal utilisation rates for the selected scholarship schemes. This method provides a detailed overview of the number of seats utilised in a given year relative to the available quota, helping to assess the efficiency and reach of the schemes.
- **Comparison Analysis**: Comparison analysis is employed to compare the characteristics of the two selected scholarship schemes. By examining their respective utilisation rates, distribution patterns, and allocation mechanisms, this method allows for a comprehensive assessment of their similarities and differences.

Data Analysis Formulas

The following formulas were used to analyse the data:

1. $$Renewal\ Utilisation\ Rate = \frac{Seats\ utilised\ in\ the\ current\ year}{Seats\ utilised\ in\ previous\ year} * 100$$

2. $$Fresh\ Utilisation\ Rate = \frac{Seats\ utilised\ in\ the\ current\ year}{Quota\ for\ the\ current\ year} * 100$$

3. $$All - India\ Average = \frac{sum\ of\ the\ seats\ utilised\ by\ all\ states\ and\ UTs}{Total\ number\ of\ seats\ for\ the\ scheme} * 100$$

4. $$The\ 5\ years\ avg = \frac{sum\ of\ the\ seats\ utilised\ (2016-2021)\ all\ over\ India}{Total\ number\ of\ seats\ for\ the\ schemes * 5} * 100$$

These formulas enable the study to quantify and compare the utilisation rates and average utilisation over the specified five-year period. They provide valuable metrics for understanding the effectiveness and impact of the scholarship schemes.

In conclusion, this research methodology focusses on analysing two central government scholarship schemes through quantitative methods, using data from the National Scholarship Portal for a comprehensive five-year period. The study aims to provide a thorough understanding of the dynamics and effectiveness of these scholarship schemes in supporting higher education.

Key Findings and Discussion

In this paper the researcher attempted to understand the utilisation of the selected scholarship scheme. This section is divided into two parts. The first part focuses on the characteristics of the scholarship, such as the number of available seats, the nature of the scholarship (merit-based, need-based, or a combination of both), coverage of tuition fees, and its impact on the utilisation rates for both fresh applicants and renewal recipients. Additionally, this section examines the utilisation patterns of the scholarship over the past five years (2016 to 2021). The second part evaluates the performance of different states and union territories in terms of their fresh and renewal utilisation rates for the scholarship schemes. This analysis serves as a means to assess the effectiveness of the schemes across different geographical regions. This statistical analysis aims to explore any potential connection between the utilisation of the scholarship schemes and its characteristics. Overall, this paper seeks to gain a comprehensive understanding of the selected scholarship scheme by examining its characteristics and analysing state/UT-level performance based on the fresh and renewal utilisation rate.

Characteristics of the Selected Scholarship Schemes and Utilisation Rate

A comprehensive analysis of the fresh and renewal utilisation rate pertaining to the selected scholarship schemes spans duration of five years, encompassing the period from 2016 to 2021. To determine the rate of utilisation for fresh applicants, the study employs the

average method. In addition, the study examines the renewal utilisation rate, which extends over a span of four years, from 2017 to 2021. By adopting this approach, the analysis seeks to capture the utilisation patterns and trends of the selected scholarship schemes over a substantial timeframe.

To present the findings, the table below showcases the characteristics of the selected scholarship schemes, providing an insightful overview of the various factors involved. Additionally, the table includes information on the utilisation rate associated with each scheme, shedding light on the extent to which these schemes have been utilised within the specified time frame.

TABLE 1

Characteristic of the Scholarship Scheme and Utilisation Rate

Characteristics/Name of Scholarship Schemes	*Post-Matric Scholarship for Students Belonging to The Minorities Communities*	*Merit Cum Means Scholarship for Professional and Technical Courses CS*
Competitive Based	No	Yes
Need Based	Yes	Yes
Tuition Fees included	Yes	Yes
Renewal Criteria	Yes (50 percent marks in previous exam and 75 per cent attendance)	Yes (Only 50 per cent marks in previous examination)
Regular Courses	General Degree Course including Diploma	Technical and Professional Courses only (Diploma Courses not included)
Scholarship Amount	1. For Class XI and XII: (a) Hosteller: Rs. 3800/- p.a* (b) Day Scholar: Rs. 2300/-p.a* 2. For UG and PG: (a) Hosteller: Rs. 5700/- p.a* (b) Day Scholar: Rs.3000/-p.a* 3. For Mphil and PhD: (a) Hosteller: Rs. 12000/- p.a* (b) Day Scholar: Rs. 5500/-p.a*	Rs. 10000/- per annum* for Hosteller Rs. 5000/- per annum* for Day Scholar
Award Usable to Public University	Yes	Yes
Award Usable to Private University	Yes	Yes
No of Scholarship	5Lakhs	60 thousand
Average Utilisation Percentage (Last 5 years)	95.07	99.39
Average Renewal Percentage (Last 4 years)	38.73	100.14

Source: Researcher's calculation from the data retrieved from NSP
*Per annum include 10 academic months

Post-Matric Scholarship for Students Belonging to The Minority Communities

The average fresh utilisation rate for post matric scholarship scheme for minority students' scheme over five years is 95.07 per cent, while the average renewal percentage over four years is 38.73 per cent. It is evident that the renewal utilisation rate is less than the fresh utilisation rate. One possible explanation for this disparity could be the stringent merit criteria that are required for renewal. The beneficiaries of this scheme are selected based on specific criteria, including belonging to a minority community and having a family income of less than Rs.2 Lakhs. However, the renewal criteria for this scheme require students to maintain at least 50 per cent marks in their previous examination and maintain a minimum of 75 per cent attendance. The stringent renewal criteria may discourage low-performing students from continuing their higher education and may pose a significant barrier to students who are struggling academically (Agasisti, Bratti, & Minaya, 2021; Doyle, 2010; Dynarski, 2003). The stringent merit criteria for the renewal process may limit the number of students who can renew their scholarships and continue their education. Therefore, it may be necessary to consider revising these criteria to enable more students to benefit from the scheme.

The Merit Cum Means Scholarship for Professional and Technical Courses CS

It is observed that The Merit Cum Means Scholarship for Professional and Technical Courses CS has a higher fresh utilisation rate over five years is 99.39 per cent, and the renewal utilisation rate over four years is 100.14 per cent, indicating that the beneficiaries of the scheme are able to retain themselves in the program easily. Besides that, the renewal utilisation rate is more than 100 per cent because the tenure of scholarship is between 2 to 4 years depending on the nature of the degree. Various studies have shown that meritorious students have a higher retention rate in higher education than average and low performing students (Baum, et al., 2021; Agasisti, Bratti, & Minaya, 2021). Moreover, the renewal eligibility criteria for this scholarship scheme are relatively lenient, requiring students to maintain only a 50 per cent in their previous examination. The strict entry criteria for pursuing a technical or professional degree course in the scheme, coupled with the lenient renewal eligibility criteria, could be the reasons for the higher renewal utilisation rate. Thus, it is seen that the Merit Cum Means Scholarship for Professional and Technical Courses is an effective scheme for promoting higher education among meritorious students. The scheme's stringent entry criteria and lenient renewal eligibility criteria help to ensure that only deserving students benefit from the scholarship while retaining a high percentage of them.

Applicability of the Scholarship Scheme on Public and Private University and Its Impact on Utilisation Rate

Another important characteristic of scholarships is their applicability to either public or private universities. The Ministry of Minority Affairs offers two scholarship schemes that allow students to utilise their scholarships at both (Public and Private) types of institutions. According to the AISHE report of 2019-20, private universities account for 70 per cent of the

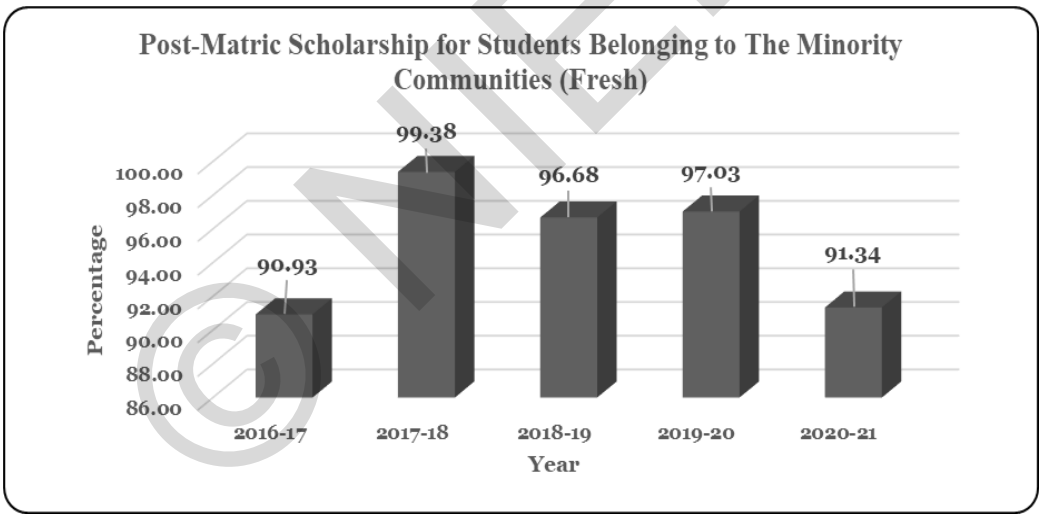
gross enrollment ratio in higher education (Ministry of Education, GOI, 2020). This fact significantly influences the utilisation of these scholarship schemes, as evident from the average fresh utilisation rates between 2016 and 2021 for the "Post-Matric Scholarship for Students Belonging to The Minorities Communities" and the "Merit Cum Means Scholarship for Professional and Technical Courses CS," which stand at 95 and 99 per cent respectively. Therefore, the criteria for using scholarships at private universities play a crucial role in determining the fresh utilisation rate of the scholarship scheme. However, in the Evaluation report of the Central Sector Scheme for college and university students by the Institute of Economic Growth (2021), the average (2012-19) 7-year fresh utilisation rate is not higher than 50 per cent, and the scholarship can be utilised in government higher education institutions.

Fresh Utilisation rate of the Selected Scholarship Schemes

It is important to analyze the utilisation pattern of the selected scheme in order to understand the impact of policy change on its pattern. The graphical representation of the fresh utilisation rate for the selected scholarship schemes are shown below:

GRAPH 1

The Fresh Utilisation Pattern of Post Matric Scholarship Scheme



Source: National Scholarship Portal

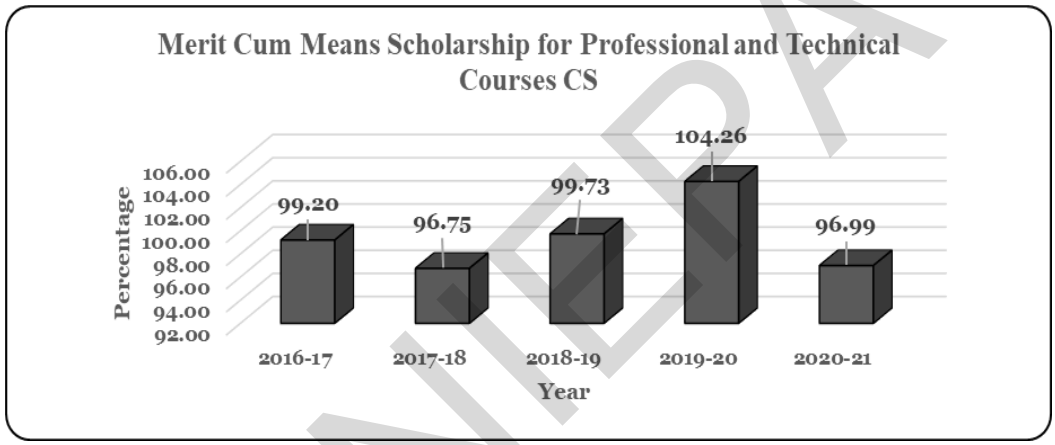
The Ministry of Minority Affairs launched the Post-Matric Scholarship for Students Belonging to The Minority Communities in 2006. The scheme aims to provide scholarships to deserving students from economically disadvantaged sections of minority communities, in order to improve their opportunities for higher education, increase their higher education attainment rate, and enhance their employability. To be eligible for the scholarship, students must belong to a minority group as defined under Section 2(c) of the National Commission for Minorities Act, 1992, have scored at least 50 per cent marks in their previous

examination, and come from families whose annual income from all sources does not exceed Rs. 2.00 lakh. The scheme targets the distribution of 5 lakh fresh scholarships. The allocation of scholarships among States/Union Territories is based on the minority population in each region according to the 2001 Census.

Over the past five years (2016-2021), the utilisation rate of the Post-Matric Scholarship for Students Belonging to The Minorities Communities scholarship scheme for new beneficiaries has ranged more than 90 per cent. In 2017-18 it has showed the highest utilisation rate that is 99.38 per cent. However, after 2017-18 it is slowly declining and it declined up to 91.34 per cent in 2020-21.

GRAPH 2

The Fresh Utilisation Rate of Merit Cum Means Scholarship Scheme



Source: National Scholarship Portal

The Ministry of Minority Affairs launched the Merit cum Means Scholarship for professional and technical courses in 2008. It aims to offer financial assistance to students from minority backgrounds with a family income of less than 2.5 lakhs. This scholarship is available for those pursuing undergraduate and postgraduate professional and technical courses, covering their tuition fees. The primary objective of this scheme is to enable students from minority communities with a family income below 2.5 lakhs to access higher education opportunities. The scheme aims to distribute sixty thousand fresh scholarships.

The utilisation rate of the "Merit Cum Means Scholarship for Professional and Technical Courses CS" has shown a very uneven trend from 2016 to 2021, as evidenced by the graph. In the year 2016-17, the utilisation rate stood at 99.20 per cent, which increased to 104.26 per cent in 2019-20 and it again get declined in 2020-21 by 96.99 per cent. This suggests that the demand for the scholarship scheme has been consistently increasing. Moreover, in the year 2019-20, the number of scholarships provided through this scheme exceeded the available seats, indicating a high level of demand among students pursuing professional and technical courses.

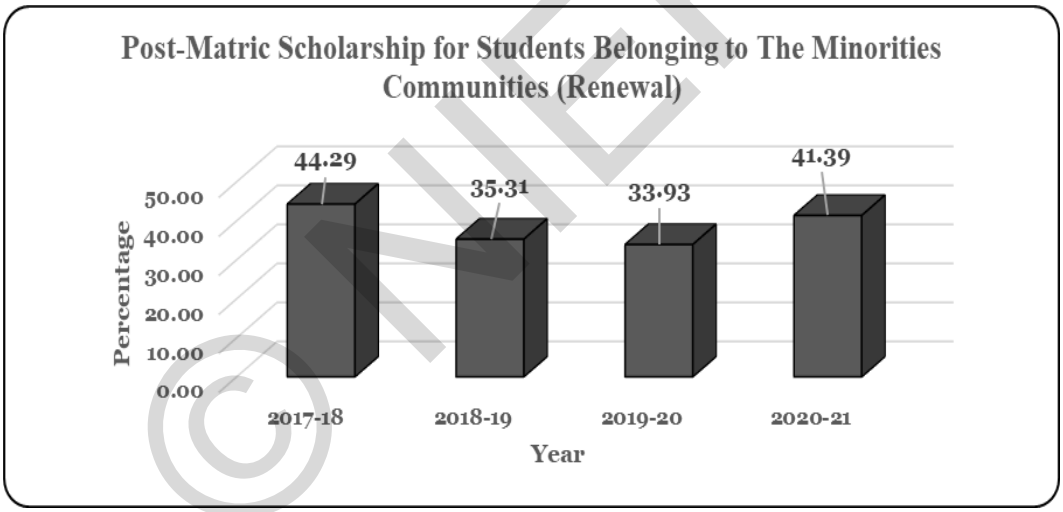
Analysis of Renewal Utilisation Rate of the Selected Scholarship Scheme

The concept of renewal utilisation rate pertains to the number of applicants who have successfully renewed their scholarship in the current academic year compared to the number of beneficiaries who had availed the scholarship in the preceding academic year. The evaluation of the renewal utilisation rate is a crucial aspect of understanding the effectiveness and sustainability of a scholarship scheme. The assessment of the renewal utilisation rate enables policymakers to identify the challenges faced by the beneficiaries in renewing their scholarship and make necessary improvements in the scheme's implementation to ensure maximum utilisation of the benefits. Additionally, the evaluation of the renewal utilisation rate can aid in estimating the budget requirements for the scholarship scheme and ensuring that the benefits reach the deserving students with minimal wastage of resources.

The graphical presentation of renewal utilisation pattern of the post matric and merit cum means scholarship scheme for past 4 years are below:

GRAPH 3

Renewal Utilisation of Post-Matric Scheme



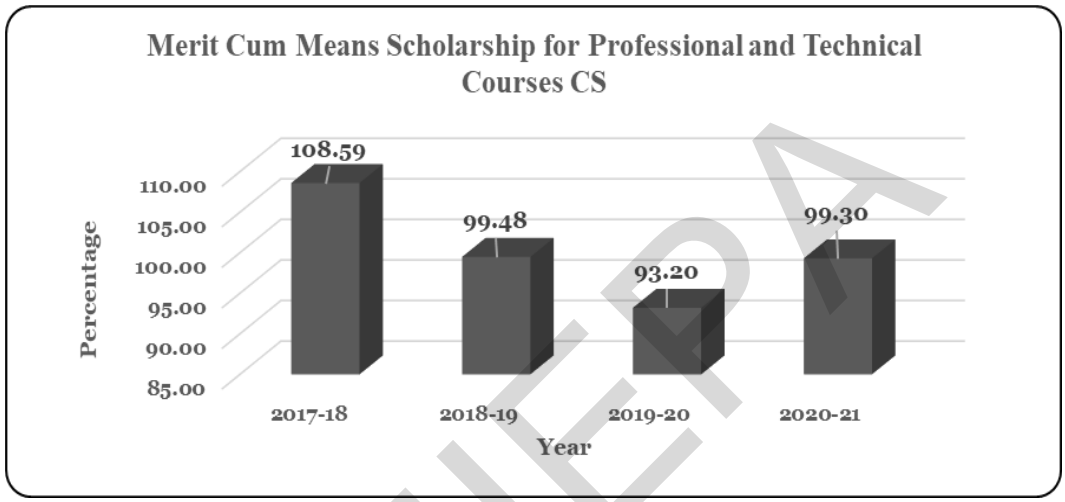
Source: National Scholarship Portal

The Post Matric Scholarship Scheme has exhibited the highest renewal utilisation rate of 44.29 per cent in the year 2017-18. However, there has been a steady decline in utilisation rate subsequently. In the year 2018-19, the utilisation rate witnessed a steep decline to 35.31 per cent. Thereafter, there was a marginal increase of 5 per cent in the utilisation rate in the year 2020-21. The Post-Matric Scholarship for Students Belonging to The Minorities Communities, when compared to the Merit Cum Means Scholarship for Professional, displays the lowest renewal utilisation rate. One potential explanation for this discrepancy is that the beneficiaries of this scheme are primarily from disadvantaged backgrounds and may not possess an outstanding academic record. Moreover, the scheme has strict renewal criteria

that may pose a challenge for beneficiaries to maintain eligibility. Another contributing factor is the relatively lower scholarship amount in comparison to other scheme included in the study. Together, these factors may account for the lower utilisation rate of the post-matric scholarship scheme.

GRAPH 4

Renewal Utilisation Pattern of Merit-cum-Means



Source: National Scholarship Portal

The Merit Cum Means Scholarship for Professional and Technical Courses demonstrates a renewal utilisation rate ranging from 108.59 to 99.30 per cent. This rate is better than that of the Post-Matric Scholarship for Students Belonging to The Minority Communities. This disparity could be attributed to the fact that the beneficiaries of this scheme are highly meritorious and capable of securing admission into professional and technical courses, which may make it easier for them to meet the renewal criteria. Additionally, the maintenance amount of the Merit Cum Means Scholarship is higher than the Post-Matric Scholarship. In short, the better renewal utilisation rate of the Merit Cum Means Scholarship can be attributed to the meritorious background of the beneficiaries, and the maintenance amount plays a vital role in this aspect.

State-Wise Performance of the Selected Scholarship Schemes

The Analysis of the performance of these scholarship schemes across states is important for several reasons. First, both the schemes are centrally funded, it is crucial to identify which states are effectively utilising these central government initiatives. Furthermore, the allocation of seats based on state and union territory makes it essential to examine the patterns of utilisation of these scholarship schemes among various states.

The average five-year utilisation rates for both schemes differ across India. Specifically, for the Post Matric Scholarship Scheme for Minority Communities, the all-India average fresh

utilisation rate from 2016 to 2021 stands at 95.07 per cent, while the renewal utilisation rate is 38.73 per cent. However, for the Merit cum Means scholarship for technical and professional education, the all-India averages for fresh and renewal utilisation rates are 99.39 per cent and 100.14 per cent, respectively.

The classification of states as best, average, or low performers in terms of fresh utilisation of seats are the following:

1. Best performing States: The percentage range of best performing states and UTs are more than and equal to 80 per cent.
2. Average performing States: The percentage range of average performing states and UTs are less than 80 per cent but more than 50 per cent.
3. Low performing States: The percentage range of low performing states and UTs are less than 50 per cent.

The tables presented below depict the categorisation of the utilisation rate as best, average, and low performers in order to optimise the utilisation of their fresh and renewal seats for all three selected scholarship schemes.

TABLE 2

Percentage Ranges for Best, Average, and Low Performing States Based on Fresh Utilisation

Performance	*Post-Matric Scholarship for Students Belonging to The Minorities Communities*	*Merit Cum Means Scholarship for Professional and Technical Courses CS.*
Best	>80 per cent	>80 per cent
Average	<80 per cent to >50 per cent	Btw 80 per cent to 50 per cent
Low	<50	<50

Source: Researcher's calculation based on NSP data

The classification of states as best, average, or low performers in terms of renewal utilisation of seats is determined by the following criteria:

1. Best performing states are those with a fresh utilisation percentage greater than the all-India average in the last four years (2017 to 2021).
2. Average performing states are those whose performance is equal to or slightly lower than the all-India utilisation rate but higher than low performing state in the last four years (2017 to 2021).
3. Low performing states are those with a fresh utilisation percentage lower than in all-India average in the last four years (2017 to 2021) indicating the poorest performance among the three categories.

Similarly, the table below shows the renewal utilisation rate for the best, average and low performing states.

TABLE 3

Percentage ranges for Best, Average, and Low Performing States Based on Renewal Utilisation.

Performance	*Post-Matric Scholarship for Students Belonging to The Minorities Communities*	*Merit Cum Means Scholarship for Professional and Technical Courses CS*
Best	>38	>80 per cent
Average	Btw 38 per cent to 15 per cent	Btw 80 per cent to 50 per cent
Low	<15 per cent	<60 per cent

Source: Researcher's calculation based on NSP data

Performance of the states in Post-Matric Scholarship for Students Belonging to The Minorities Communities

The tables below present the state with best, average, and low utilisation rate of fresh and renewal seats for the post matric scholarship for students belonging to the minorities communities.

TABLE 4

State-Wise Fresh Utilisation Performance for the Post Matric Scheme

Post-Matric Scholarship for Students Belonging to The Minority Communities (Fresh Utilisation)		
Best Performing States (Fresh Utilisation rate >80 per cent)	*Average Performing State (Fresh Utilisation Rate<80 to >50 per cent)*	*Low Performing States (Fresh Utilisation Rate <50 per cent)*
Puducherry (165%)	West Bengal (78.77 per cent)	Orissa (49.53 per cent)
Karnataka (158.02 per cent)	Nagaland (71.06 per cent)	Mizoram (42.07 per cent)
Tamil Nadu (146 per cent)	Maharashtra (67.40 per cent)	Goa (16.40 per cent)
Rajasthan (132.68 per cent)	Chhattisgarh (66.04 per cent)	Sikkim (15.58 per cent)
Madhya Pradesh (117.89 per cent)	Delhi (62.48 per cent)	Chandigarh (13.87 per cent)
Gujarat (114.83 per cent)	Tripura (58.98)	Andaman & Nicobar (13.41 per cent)
Jammu & Kashmir (114.22 per cent)	Jharkhand (58.30)	Dadra & Nagar Haveli (9.80 per cent)
Manipur (112.47 per cent)	Haryana (54.70)	Arunachal Pradesh (0.00 per cent)
Punjab (112.17 per cent)	Himachal Pradesh (52.34)	Daman & Diu (0.00 per cent)
Bihar (111.02 per cent)		Lakshadweep (0.00 per cent)
Kerala (97.64 per cent)		
Andhra Pradesh (96.42 per cent)		
Telangana (96.42 per cent)		
Meghalaya (93.71 per cent)		
Uttarakhand (89.24 per cent)		
Uttar Pradesh (85.83 per cent)		
Assam (85.02 per cent)		
17	9	10

Source: Researcher's calculation based on NSP data

TABLE 5

State-wise Renewal Utilisation performance for the Post Matric Scheme

Post-Matric Scholarship for Students Belonging to The Minorities Communities (Renewal Utilisation)		
Best Performing States (Renewal Utilisation rate >38 per cent)	*Average Performing State (Renewal Utilisation Rate <38 and > 15 per cent*	*Low Performing States (Renewal Utilisation Rate <15 per cent)*
Karnataka (359.60 per cent)	Uttarakhand (36.10 per cent)	Mizoram (13.25 per cent)
Kerala (110.44 per cent)	Orissa (34.82 per cent)	Andaman & Nicobar (12.50 per cent)
Jammu & Kashmir (79.69 per cent)	Rajasthan (33.98 per cent)	Sikkim (5.34 per cent)
Jharkhand (59.65 per cent)	Uttar Pradesh (33.49 per cent)	Arunachal Pradesh (0.00 per cent)
Chhattisgarh (52.44 per cent)	Punjab (32.92 per cent)	Dadra & Nagar Haveli (0.00 per cent)
Puducherry (51.91 per cent)	Himachal Pradesh (31.82 per cent)	Daman & Diu (0.00 per cent)
Tamil Nadu (50.21 per cent)	Chandigarh (31.57 per cent)	Lakshadweep (0.00 per cent)
Andhra Pradesh (48.47 per cent)	Goa (31.18 per cent)	
Madhya Pradesh (48.47 per cent)	Meghalaya (30.70 per cent)	
Maharashtra (47.79 per cent)	Nagaland (29.81)	
Gujarat (45.23 per cent)	Assam (28.76 per cent)	
Telangana (44.30 per cent)	West Bengal (27.88 per cent)	
	Manipur (27.60 per cent)	
	Haryana (25.65 per cent)	
	Tripura (22.35 per cent)	
	Bihar (21.88 per cent)	
	Delhi (19.34 per cent)	
12	17	7

Source: Researcher's calculation based on NSP data

The finding of both the tables are as follows:

1. There are 17 states that stand out as best performing in the scheme, with a fresh utilisation rate exceeding 80 per cent. In comparison, there are 12 states that exhibit the best performance in renewal rate of the scheme, with a fresh utilisation rate exceeding 38 per cent. The states that are common to both categories and display the best performance in fresh and renewal utilisation rates are Karnataka, Kerala, Jammu & Kashmir, Puducherry, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Gujarat, and Telangana.
2. Likewise, there are 8 states that demonstrate average performance in fresh utilisation rate, with a fresh utilisation rate ranging between 80 to 50 per cent. In contrast, there are 17 states with average performance in renewal utilisation rate, with a renewal utilisation rate ranging between 38 to 15 per cent. The states that exhibit average performance in both fresh and renewal utilisation rates are West Bengal, Delhi, Haryana, Tripura and Himachal Pradesh.
3. There are 10 states that display low performance in the scheme, with a fresh utilisation rate of less than 50 per cent. In comparison, there are only 7 states with low performance in renewal utilisation rate, with a renewal utilisation rate of less than 15 per cent. The states that perform poorly in both fresh and renewal utilisation rates are Mizoram, Andaman Nicobar, Sikkim, Arunachal Pradesh, Dadra & Nagar Haveli, Daman and Diu, and Lakshadweep.
4. From Table 4, it is evident that some states and UTs have a utilisation rate exceeding 100 per cent, while others have zero per cent utilisation. This variation may contribute to the overall national average of 95.07 per cent, where some states and UTs exceed their seat quotas, whereas others fail to utilise even a single seat from their allocation

Performance of the States in Merit Cum Means Scholarship for Professional and Technical Courses

The tables below present the best, average, and low performing states for the utilisation rate of fresh and renewal seats in the selected scholarship schemes.

TABLE 6

State-Wise Fresh Utilisation Performance for the Merit cum Means Scheme.

Merit Cum Means Scholarship for Professional and Technical Courses CS (Fresh Utilisation)		
Best Performing States (Fresh Utilisation rate >80 per cent)	*Average Performing State (Fresh Utilisation Rate <80 to >50 per cent)*	*Low Performing States (Fresh Utilisation Rate <50 per cent)*
Karnataka (379.21 per cent)	Chhattisgarh (75.49 per cent)	Punjab (42.59 per cent)
Kerala (215.55 per cent)	Puducherry (67.69 per cent)	Goa (40.41 per cent)
Jammu & Kashmir (178.21 per cent)	Uttarakhand (67.62 per cent)	Maharashtra (37.84 per cent)
Mizoram (147.99 per cent)	West Bengal (64.50 per cent)	Himachal Pradesh (32.00 per cent)
Andhra Pradesh (121.28)	Manipur (63.61 per cent)	Delhi (27.18 per cent)
Telangana (121.28 per cent)	Jharkhand (62.70 per cent)	Sikkim (23.17 per cent)
Tamil Nadu (116.69)	Haryana (57.30 per cent)	Chandigarh (10.30 per cent)
Bihar (111.21)	Orissa (53.93 per cent)	Andaman and Nicobar Island (7.33 per cent)
Assam (110.64)	Uttar Pradesh (53.41 per cent)	Arunachal Pradesh (0.00 per cent)
Meghalaya (107.03)	Tripura (50.28 per cent)	Dadra & Nagar Haveli (0.00 per cent)
Gujarat (106.12)		Lakshadweep (0.00 per cent)
Rajasthan (94.33 per cent)		Daman & Diu (0.00 per cent)
Nagaland (92.54)		
Madhya Pradesh (83.65 per cent)		
14	10	12

Source: Researcher's calculation based on NSP data

TABLE 7

State-Wise Renewal Utilisation Performance for the Merit cum Means Scheme.

Merit Cum Means Scholarship for Professional and Technical Courses CS (Renewal Utilisation)		
Best Performing States (Renewal Utilisation rate >80 per cent)	*Average Performing State (Renewal Utilisation Rate <80 and >50 per cent)*	*Low Performing States (Renewal Utilisation Rate <50 per cent)*
Delhi (220.77 per cent)	Assam (72.75 per cent)	Chandigarh (38.64 per cent)
Kerala (161.68 per cent)	Manipur (69.72 per cent)	Sikkim (36.76 per cent)
Rajasthan (155.32 per cent)	Tripura (69.51 per cent)	Mizoram (21.67 per cent)
Nagaland (123.84 per cent)	Goa (69.18 per cent)	Andaman and Nicobar Island (12.50 per cent)
Chhattisgarh (111.12 per cent)	Jharkhand (53.85 per cent)	Arunachal Pradesh (0.00 per cent)
Tamil Nadu (108.41 per cent)		Dadra & Nagar Haveli (0.00 per cent)
West Bengal (106.19 per cent)		Daman & Diu (0.00 per cent)
Puducherry (103.16 per cent)		Lakshadweep (0.00 per cent)
Madhya Pradesh (102.28 per cent)		
Meghalaya (102.04 per cent)		
Uttarakhand (97.04 per cent)		
Gujarat (96.86 per cent)		
Bihar (93.47 per cent)		
Haryana (88.11 per cent)		
Uttar Pradesh (87.87 per cent)		
Andhra Pradesh (85.01 per cent)		
Telangana (85.01 per cent)		
Orissa (84.04 per cent)		
Maharashtra (83.54 per cent)		
Punjab (82.27 per cent)		
Karnataka (82.23 per cent)		
Himachal Pradesh (82.01 per cent)		
Jammu & Kashmir (80.39 per cent)		
23	5	8

Source: Researcher's calculation based on NSP data

The finding of both the tables are as follows:

1. There are 14 states and UTs that are considered the best performers in the scheme, with a fresh utilisation rate of over 80 per cent. Additionally, there are 23 states and UTs that demonstrate the best performance in renewal rate of the scheme, with a fresh utilisation rate exceeding 80 per cent. Notably, all 14 states that perform the best in fresh utilisation rate also display the best performance in the renewal utilisation rate in this scheme. However, the 10 more states showing best performance in renewal utilisation rate are the showing average and low performance in fresh utilisation rate.
2. Similarly, there are 11 states and UTs with average performance in fresh utilisation rate, exhibiting a fresh utilisation rate ranging between 80 to 50 per cent. Comparatively, there are 5 states and UTs with average performance in renewal utilisation rate, with a renewal utilisation rate ranging between 80 to 50 per cent. There are only 3 common states performing average in both fresh and renewal utilisation rate are Manipur, Tripura and Jharkhand
3. There are 11 states that exhibit low performance in the scheme, with a fresh utilisation rate of less than 50 per cent. In comparison, there are also 8 states with low performance in renewal utilisation rate, with a renewal utilisation rate of less than 50 per cent. There are 7 common states performing low in both fresh and renewal utilisation rate are Sikkim, Andaman and Nicobar Island, Arunachal Pradesh, Dadra & Nagar Haveli, Daman & Diu and Lakshadweep (0.00 per cent)
4. The states that participate in this scheme perform similarly, with no significant variation or gap between the fresh and renewal utilisation rates. For example, the all-India fresh utilisation rate for the Merit cum Means scholarship scheme between 2016 and 2021 was 99.39 per cent, while the all-India renewal utilisation percentage for the same scheme during the same period was 100.14 per cent.
5. In contrast, the Post-Matric Scholarship for Students Belonging to The Minorities Communities exhibits a wide variation or gap between the percentage of fresh and renewal utilisation rate. Specifically, the all-India fresh utilisation rate for this scheme between 2016 and 2021 was 95.07 per cent, whereas the all-India renewal utilisation percentage for the same period was 38.73 per cent.
6. Furthermore, it is worth noting that the average fresh utilisation rate for both schemes across India exceeds 90 per cent. Nevertheless, only fifty to sixty per cent of all Indian states and Union Territories fall into the category of best-performing states. One key factor contributing to this disparity is that certain states and UTs are surpassing their seat quotas in utilisation, while others are facing challenges in utilising of their allocated seats.

Conclusion

In India the central government provides various scholarship schemes to pursue higher education. The budget allocated for scholarship schemes in India has experienced a significant rise. According to a study conducted by M.R. Narayan (2018), the budget for the scholarship scheme increased from 7.6 million in 2003-04 to 2,396 million in 2014-15 (Narayan, 2018). However, the study on scholarship schemes in India is limited to

government reports. The utilisation rate among central government scholarship schemes is found to be very low, and the reasons for this are varied.

The analysis of the study revealed that the utilisation rate of the post-matric scholarship, which is available to students belonging to minority communities, is 99.07 per cent over a period of 5 years. However, the renewal rate for the scholarship over a 4-year period is only 38.73 per cent. The study's findings suggest that there is difference in utilisation rates between fresh and renewal applicants the reason need to be studied further but apparently it may be due to the rigorous renewal merit criteria as against the relaxed eligibility criteria to obtain the scholarship. It was also found in the research study that strict renewal criteria in the means scholarship scheme assist students in improving their academic performance (Agasisti, Bratti, & Minaya, 2021). It is also evident that such stringent merit criteria may discourage low-performing students from continuing their higher education.

The analysis of the merit cum means scholarship scheme for technical and professional education has demonstrated that both the fresh and renewal utilisation rates of the scholarship scheme are relatively high, with minimal disparity between them. The stringent eligibility criteria of the scheme ensure that beneficiaries are easily able to meet the renewal criteria. This may be one of the reasons why the merit cum means scholarship schemes have higher renewal rates. In various study authors argue that it is easier for meritorious students to sustain in higher education than for average and low-performing students (Baum, et al., 2021; Rana, Al Mamun, Hossain, & Rekha, 2021).

There are eight best-performing states in both the scholarship schemes for fresh and renewal utilisation rates. These states include Kerala, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Gujarat, Jammu & Kashmir, and Madhya Pradesh. None of these states perform at an average level in both schemes for fresh and renewal utilisation rates. Furthermore, there are five states that perform poorly in all three scholarship schemes, namely Arunachal Pradesh, Dadra Nagar Haveli, Daman & Diu, Andaman & Nicobar, and Lakshadweep.

The state of Karnataka falls under the category of best performance in both fresh and renewal utilisation for both schemes. One potential explanation for this is that the ranking system for higher education institutions in Karnataka considers scholarships and their disbursement as a major criterion. Higher education institutions in the state compete among themselves to achieve higher rankings, as suggested by (Narayan, 2018). This competition encourages them to make more efforts to increase the number of students eligible for scholarships. Further investigation is needed to comprehensively understand the variations among states in terms of scholarship utilisation rates for both fresh and renewal applicants.

Recommendations

This study focusses on an analysis of the utilisation rate of the central government scholarship schemes in India and proposes recommendations for policy reform. The research reveals that the strict merit criteria in the need-based scholarship scheme need to be re-evaluated in order to ensure the sustainability of students' higher education and the effectiveness of the scholarship scheme.

The study also highlights significant variations in the utilisation rates of the selected scholarship schemes across different states in India. While some states demonstrate high utilisation rates, others struggle with average or low rates. To improve overall utilisation

rates, states with successful utilisation rates should share their best practices and knowledge with states facing challenges. This knowledge exchange can provide valuable insights and practical strategies to address factors hindering utilisation rates, such as lack of awareness or complex application procedures. Furthermore, implementing successful policies and strategies from states with higher utilisation rates can be beneficial. This necessitates further investigation and monitoring to identify the reasons behind the variation and enhance utilisation rates.

It is crucial to emphasise that knowledge sharing should be a collaborative effort between the states and the central government, with the latter playing a vital role in facilitating this exchange. The central government can establish platforms and forums for sharing best practices and provide financial and technical support to states in need. This collaborative approach has the potential to improve utilisation rates of scholarship schemes in India and contribute to overall advancements in higher education outcomes throughout the country.

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National Institute of Educational Planning and Administration (NIEPA)
(Deemed to be University u/s 3 of the UGC Act, 1956)
17-B Sri Aurobindo Marg, New Delhi-110016
Web: www.niepa.ac.in

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Master of Arts in Education and Development
ACADEMIC SESSION: 2024-25

Applications are invited from eligible candidates for admission to the Master of Arts in Education and Development (MAED), a two-year full-time programme, offered by the National Institute of Educational Planning and Administration (NIEPA).

Eligibility Criteria: A 3-year or 4-year bachelor's degree in any discipline recognized by the corresponding statutory regulatory body or equivalent qualification from a foreign educational institution.

Only those candidates who have qualified Paper COQP11 of Common University Entrance Test (CUET)-PG 2024, conducted by the National Testing Agency (NTA), shall be eligible to apply in the MAED Programme.

The candidates appearing in the final semester of the Bachelor's Programs are eligible to apply. However, they have to produce the certificate/marksheet mentioning successful completion of Bachelor's Program at the date of the admission. The candidature of those candidates unable to submit the certificate/marksheet mentioning successful completion of Bachelor's Program at the date of admission will be rejected automatically.

Selection Procedure: The eligible candidates (who have qualified for Paper COQP11 of CUET-PG 2024) will have to appear in the Institute's National Level Entrance Test followed by a personal interview. The Entrance Test will be of two hours (120 minutes) in duration. The Test will consist of 'Descriptive Type Questions' with a maximum marks of 100. The questions will be from social science disciplines. The Entrance Test (Written Test) will be conducted online/offline mode.

Those who qualify in the Entrance Test will be called for face-to-face or online interview. The candidates will have to interact with the Interview Committee. The interview will be of 50 marks.

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Important Dates	
Submission of Online Application Starts on	April 01, 2024
Last Date for Online Application	June 16, 2024
Written Test	July 02, 2024
Personal Interviews	July 09, 2024
Declaration of Final Results	July 16, 2024
Admissions	July 22, 2024
Commencement of the Classes	July 29, 2024

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Examining Teachers' Self-Efficacy Towards STEAM Approach in Education

Tarun Kumar Tyagi*
Pragya Gupta#
Vritika Singh**

Abstract

STEAM, the fusion of five fields of study, i.e., Science, Technology, Engineering, Arts and Mathematics, has recently been recognised and widely accepted as an educational approach to foster the 21st century skills like critical thinking, creative thinking, and problem-skills (NEP 2020). National Education Policy 2020 emphasised the incorporation of STEAM education into mainstream learning and considered it as the perfect amalgamation of entrepreneurial, problem solving and innovation mindset. Teacher self-efficacy plays a pivotal role in the successful implementation of education reforms. The present study is aimed to examine teachers' self-efficacy towards use of STEAM based activities in classrooms. A descriptive survey method was used to conduct the study. One hundred forty-six teachers were randomly selected as a sample for the study. A self-developed tool for assessing the teachers' self-efficacy towards STEAM approach, based on the ideas of Tschannen-Moran and Hoy (2001), was administered to the selected sample. Percentage analysis and t-test were used to analyse the data. The study results reveal that only a few teachers have a high level of teachers' self-efficacy towards STEAM approach in education, in its various dimensions, namely instructional strategies, classroom management and student engagement. While gender, type of institutions and stream-based differences were not found relevant for the self-efficacy of teachers towards the STEAM approach, the teachers' type and locality differences in the self-efficacy of teachers towards STEAM were found relevant and in favour of in-service teachers and urban teachers respectively. Further, it was revealed that the STEAM approach provides the opportunity for

* Department of Teacher Education, Central University of South Bihar, Gaya-824236, Bihar.
Email: taruntyagi@cusb.ac.in
Department of Teacher Education, Central University of South Bihar, Gaya-824236, Bihar.
** Department of Teacher Education, National Council of Educational Research and Training (NCERT), New Delhi.

learners in terms of hands-on experience, holistic learning, encouraging creativity and innovation, collaboration and teamwork, and equal opportunity and inclusivity. But aligning the curricular and assessment aspects based on STEAM activities, teachers' professional development and awareness of parents are needed to achieve the goal of STEAM education. Educational and policy implications and directions for further educational research are also outlined.

Introduction

In this digital era, we all are witnessing how modern technology is transforming the entire education system nationally as well as globally. Recent educational reforms in the light of National Education Policy (NEP) 2020 call for implementing STEAM (Science, Technology, Engineering, Arts and Mathematics) practice in teaching-learning process by which future generations would learn how to solve real-life problems by connecting with the content and practices of STEAM. According to NEP (2020), integration of humanities and arts with Science, Technology, Engineering and Mathematics (STEM) in the teaching-learning process has consistently showed positive learning outcomes, including increased creativity and innovation, critical thinking and higher-order thinking capacities, problem-solving abilities, teamwork, communication skills, more in-depth learning and mastery of curricula across fields, increases in social and moral awareness, etc., besides general engagement and enjoyment of learning. Thus, NEP (2020) emphasises a multidisciplinary approach for achieving the goal of transforming the education system to cater to the needs of 21st century learners. Research demonstrates that teachers' self-efficacy significantly contributes to their persistence, commitment, job satisfaction and instructional quality (Zakariya, 2020). Therefore, in order to accomplish this vision successfully, there is an urgent need to determine and foster the self-efficacy of pre-service and in-service teachers. Ergo, educational institutions are curious to set up specialised STEAM labs that are accommodated with the new focus on innovation-based learning over test taking. Hence, STEAM-based education has become the thrust area in the field of teacher education (NEP 2020).

Theoretical Background

The STEAM Approach: The 'STEAM Approach' (fusion of five disciplines, i.e., Science, Technology, Engineering, Arts and Mathematics) has been considered and widely accepted as a teaching method to foster the 21st century skills (NEP, 2020). It incorporates 4 C's of the 21st-century skills, viz creativity, critical thinking, collaboration, and communication. Integration of Science, Technology, Engineering, Arts and Mathematics (STEAM) as an integrated curriculum to educate students in five disciplines is considered as an interdisciplinary approach. Yakman and Lee (2012) defined STEAM education as the interpretation of Science and Technology through Engineering and the Arts (a century that covered the humanities was studied); all based on mathematical elements. Researchers and practitioners have found that students become more motivated, interested, self-directed, and persistent in learning when they are instructed to solve real world STEM problems in a more integrated manner (Lee et al, 2019). STEAM education was introduced to improve the

competencies of learners and ensure the integration of Science, Technology, Engineering, Arts, and Mathematics.

S is for Science: It emphasises the performance of small experiments as learners explore and discover their surroundings. Children are considered natural scientists as they are curious to learn through experiments and observe the patterns and events in their daily life. Therefore, science should be connected to daily life activities of the learners. For example, why is the sky blue in colour, and what is the reason behind the twinkling of the star, and so on.

T is for Technology: It emphasises an understanding of how tools help us to accomplish the tasks smoothly and effectively. For example, how adding wheels to different objects like trains, buses, etc., makes it easier to move. Students will observe the process and pattern, and know the cause and effect behind the occurrence of phenomena like the use of scissors and levers, etc., in their surroundings.

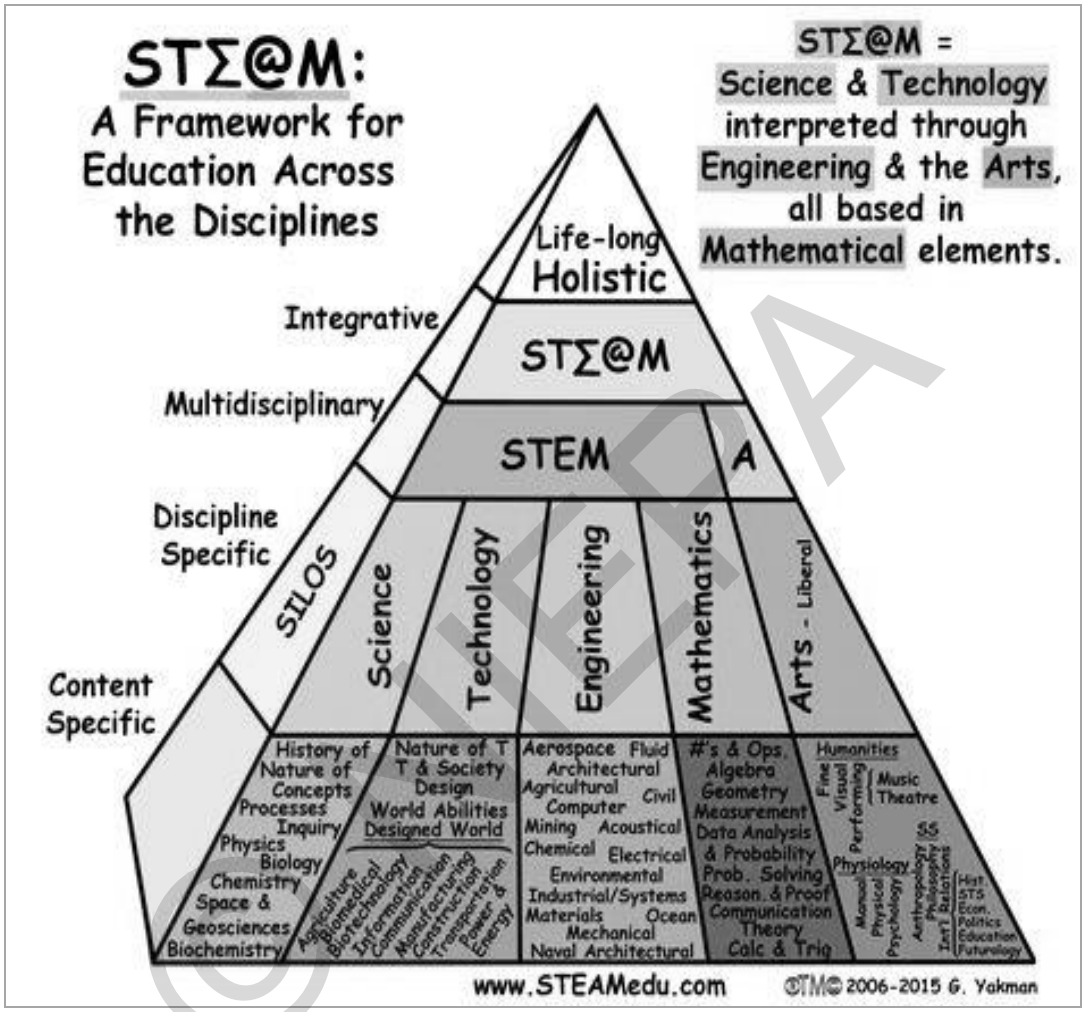
E is for Engineering: It focusses on the application of Science, Mathematics and Technology for solving the problems. For example, how to make a pillar by using the small wooden blocks by visualising a slight difference in the base, dimensions, volume, sequence and weight of objects (cardboard)? In this way, students try to solve the structural problems in daily life and play with different games like how to raise the four sticks in the classroom or at any place without using the hole in the ground and other means?

A is for Arts: It emphasises the expression of human being's creative skills and imagination in the fine arts (graphics, craft, & painting), communication (literature, multimedia, advertising, social media), performance (film, drama, theatre, music, dance), lifestyle (fashion, interior design, product design) and character (culture, behaviour, attitude). In early childhood, it is very helpful to express their cognition, feelings and interest through their drawings, paintings, and writing etc. by involving the mathematical concepts in Arts like symmetry, proportion, colour combination, aesthetic sense and affective factors. Therefore, it makes learning more effective and innovative.

M is for Mathematics: It emphasises the use of Mathematics activities in the surroundings. Even a small child uses the mathematical concept in everyday activity like 'more' and 'less' while demanding food or drink. In breakfast, they observe and think about the shapes of foods that the sandwich can be cut into different shapes like triangular, square and rectangular, and even use mathematical language like bigger, smaller, heavier and lighter etc. However, it is an informal use of Mathematics in their routine activities.

It was George Yakman (2008) who proposed the term STEAM by including Arts into STEM. It provides opportunities for the students (i) to think outside the box, (ii) to express innovative and creative ideas, (iii) to feel comfortable in hands-on-learning, (iv) to take ownership of their learning, (iv) to work collaboratively with others. According to Yakman (2008), ST∑@M Education means "Science and Technology, interpreted through Engineering and the Arts, all based in a language of Mathematics."

FIGURE 1



Source: www.STEAMedu.com

The STEAM in teaching-learning process enhances children's creativity and provides them the ability to solve problems as well as connect with the environment (Habibi, 2023; Ozkan & Topsakal, 2021, Yakman, 2008). In support, Erol et al (2023) also reported similar findings — that STEAM based activities applied with tales improved the students' creativity and problem-solving skills. Therefore, in this rapidly changing and transforming world and social life, STEAM education enables the future generations to be innovative, inventive, self-confident, logical thinker, technology literate and better problem solvers (Morrison, 2006).

Teachers' Self-Efficacy

According to Bandura (1977), self-efficacy is conceptualised as one's beliefs in being able to act in a certain situation to achieve some specific goals. It is defined as the judgement or assessment of one's capabilities to perform a particular given task successfully (Bandura, 2012). Bandura shared the following four sources of self-efficacy which are very important for the teachers: (i) Mastery of teaching experience (ii) Vicarious experience (iii) Social persuasion and (iv) Physiological and emotional behaviour. It significantly contributes to their persistence, commitment, job satisfaction and instructional quality (Tschannen-Moran & Hoy, 2001; Zakariya, 2020). Thus, self-efficacy is regarded as a major trigger for purposeful behaviour and the perseverance to achieve set goals, which usually results in excellent performance — or in the long run to a science career (Özcan & Gümüş, 2019). To understand how people adapt to change requires a study of human beliefs about personal competence, adaptation, and confidence in changing situations (Lee et al, 2019). Teachers' self-efficacy is related to the issue of readiness for change. Research on the teachers' readiness for STEM education, especially focussing on Indian pre-service teachers, is seldom reported. In the disciplines of science, technology, engineering, arts and mathematics (STEAM) which received scholarly attention in schools as well as in higher education, self-efficacy is a strong indicator of teachers' confidence and skills to use STEAM based approach in teaching-learning process. Teachers with high self-efficacy influence students' learning, interest, careers and influence their behaviour also. It enables teachers to be less critical of students when they make errors and are in a struggling phase. Tschannen-Moran and Hoy (2001) reported that teacher efficacy has proved to be strongly related to many meaningful educational outcomes such as teachers' persistence, enthusiasm, commitment and instructional behaviour, as well as student outcomes such as achievement, motivation and self-efficacy beliefs.

Teachers' self-efficacy means that a teacher judges his/her capabilities to organise and implement the strategies necessary for successfully accomplishing a specific teaching task in a particular context; this is found to be significantly linked to their classroom behaviour and achieving learning outcomes. Therefore, in the present study, teachers' self-efficacy toward STEAM approach was considered to be based on the composite scores on the scale developed by the investigator followed the three dimensions namely instructional strategies, classroom management and student engagement.

Rationale of the Study

National Educational Policy (NEP) 2020 highlights the importance of pedagogical practices like experiential learning, STEAM based teaching and game-based learning for providing the equitable and inclusive education for all in the large-scale heterogeneity of students in Indian classrooms. Vasquez et al (2013) suggested using multi-, inter-, and transdisciplinary approaches for crossing the boundaries between disciplines to apply multifaceted knowledge to solve real-world problems. The primary feature of STEAM approach is promoting and increasing discipline crossing the five STEAM disciplines by blurring the boundaries between the disciplines (Vasquez et al, 2013; Tyagi & Gupta, 2021). Hackman, Zhang and He (2021) reported a significant difference between the private and public-school teachers with respect to STEM attitude and marginally difference at grade

level wise. Similarly, Altakhyneh and Abumusa (2020) reported a significant difference between postgraduate and undergraduate students, trained and untrained students about STEM approaches in education. Kumari (2022) found a very low level of understanding in the prospective science teachers towards STEAM in science teaching. On the other hand, Park et al (2016) found that most of the teachers have positive views about STEAM whereas female and new teachers were more negative. Prior research has also indicated that teachers' gender may more or less influence students' STEM learning (Bottia et al, 2015; Lee et al. 2019). Lee et al. (2019) reported that male teachers outperformed female teachers in each dimension of the survey.

Teachers with a high level of self-efficacy are flexible enough to adapt new methods and have the ability to adopt new techniques for making effective teaching-learning processes. Therefore, teacher's self-efficacy provides noteworthy information on how to improve teacher education and teacher professional development. But ample evidence of the research in the field of STEAM education has not been found especially in India as authors reviewed. After analysing the review of the related literature, very few research studies have been conducted in this field, especially in India as the investigator reviewed. Therefore, the present study has been taken to address the following research questions:

1. What is the level of pre-service teachers' self-efficacy towards STEAM approach in education?
2. Do types of teachers, gender, streams, locality and types of institutions affect teachers' self-efficacy towards STEAM approach in education?

Methodology

The purpose of the present study is to examine the level of teachers' self-efficacy towards STEAM approach in education. Therefore, a descriptive survey method was used to conduct the study.

Population and Sample: In the present study, all the teachers and pre-service teachers (final semester of students) of Gaya district of Bihar were considered as the population of the study. 146 teachers were selected conveniently in the sample of the study as shown in Table 1.

TABLE 1

Detail of Sample (N=146)

Types of Teachers & Gender Rural -52 & Urban-94	*Science*		*Social science*		*Total*
	Male	*Female*	*Male*	*Female*	
Pre-Service (PS)	21	24	33	24	102
In-Service (IS)	10	11	12	11	44
Total	31	35	45	35	146

Description of the Tool: In the present study, Teachers' Self-Efficacy tool developed by authors based on the idea of Tschannen-Moran and Hoy (2001) was used to assess the self-efficacy of teachers towards STEAM approach. It consists of three dimensions namely instructional strategies, classroom management and student engagement. The Table 2 depicts the pattern which was used to provide the participants' response on the statement of the scale: - Not at all (1), Very Little/Less (3), At Some Extent (5), Moderately (7), Great Deal (9)

TABLE 2

Dimensions and Items

Dimensions	*Item Code*	*Items*
Instructional Strategies	IS 1	How well can you use hands-on experience/activity based on the STEAM approach?
	IS 2	To what extent can you provide alternative explanations or examples for struggling students in their learning?
	IS 3	To what extent can you make your expectations clear about student behaviour?
	IS 4	How much can you do to get students to believe that they can perform well academically by using the STEAM approach?
	IS 5	To what extent can you cater the need of slow learners with the use of STEAM approach?
	IS 6	To what extent can you cater the needs of advanced learners with the use of STEAM approach?
	IS 7	How well can you frame the good questions based on the STEAM approach from real-life situations?
	IS 8	How well can you respond to the questions raised by students while teaching through the STEAM approach?
	IS 9	To what extent can you encourage the students to think out-of-the box while using STEAM approach?
	IS 10	To what extent can you gauge students' conceptual understanding of what you have taught?
	IS 11	To what extent can you determine the attainment of students' learning outcomes while using the STEAM approach?
	IS 12	To what extent can you provide challenging situations for every student while using the STEAM approach?
Classroom Management	CM 1	How well can you provide feedback on students' learning with STEAM based activities?
	CM 2	To what extent can you reduce the students' psychological absence (mentally absenteeism) in the classroom with the use of STEAM approach?

Cont…

	CM 3	To what extent can you use the advanced applications of STEAM approach in the teaching-learning process?
	CM 4	How well can you use STEAM approach to connect the application of theoretical knowledge for solving real word problems?
	CM 5	How well can you foster students' creativity by using the STEAM based approach?
	CM 6	How well can you enhance the motivation of every student in their respective courses through the STEAM approach?
	CM 7	How well can you develop interdisciplinary knowledge while teaching mathematics/science/ language/social science confidently?
	CM 8	To what extent can you motivate the students to work together through STEAM based projects?
	CM 9	To what extent can you inculcate the ethical/human values among students through the STEAM approach.
	CM 10	How well can you incorporate the STEAM activities in the respective course-content/discipline?
	CM 11	How well can you make a multidisciplinary classroom environment with the use of STEAM approach?
	CM 12	To what extent can you control disruptive behaviour of students while using the STEAM approach in the classroom?
Student Engagement	SE 1	How well can you reduce the gap between boys and girls while using the STEAM approach in the classroom?
	SE 2	To what extent can you encourage the parents to involve their children in STEAM activities at their home?
	SE 3	How well can you manage the classroom discipline while teaching through the STEAM approach?
	SE 4	How well can you make the classroom environment more inclusive while using the STEAM approach?
	SE 5	How much can you do to calm the defiant (disobedient) students through the use of STEAM approach?
	SE 6	How well can you encourage the students to think critically while using STEAM based activities?

Based on the data collected from 96 participants, the reliability of the Teachers' Self-Efficacy Scale towards STEAM approach in education was established. The authors used Cronbach's alpha (coefficient alpha) to establish the internal consistency of the tool consisting of three dimensions namely, *Instructional Strategies (IS), Classroom Management (CM)* and *Student Engagement (SE).* The tool is developed based on a five-point scale like not at all (1), very little (3), at some extent (5), moderately (7), and great deal (9). The following formula has been used to find out the coefficient alpha:

$$\alpha = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum(SD^2{}_i)}{SD^2{}_t}\right)$$

Where:

n = the number of items in the test; SD_t = Standard deviation of test score; and SD_i = the standard deviation of item score

TABLE 3

Reliability of the Scale

S. No.	*Dimension(s)*	*No of Items (n)*	$\sum(SD^2{}_i)$	$SD^2{}_t$	*Coefficient Alpha (α)*
1.	IS	12	48.47	260.09	0.88
2.	CM	12	27.37	102.33	0.85
3.	SE	6	44.78	274.25	0.92
	Total	30	121.24	1602.70	0.95

As can be seen from Table 3, the reliability coefficients on the three dimensions, namely instructional strategies, classroom management and student engagement, were found to be 0.88, 0.85 and 0.92 respectively. Hence, on the basis of internal consistency analysis, the reliability coefficient of the scale was found to be 0.95. Therefore, it indicates a high degree of internal consistency.

Validity of the Tool: The appropriateness of items of the self-efficacy scale in terms of trustworthiness and truthfulness was piloted and checked by a panel of one expert and one educational psychologist. They reviewed all items of the tool by considering the fundamental aspects like content, items, language, vagueness, length, dimensions, etc. After receiving the experts' feedback, a minor revision was applied to the tool for improving its content validity.

Result

TABLE 4

Study of Participants

Variable	*N*	*Min*	*Max*	*Mean*	*SD*	*Skewness*	*Kurtosis*
Teachers' Self-Efficacy towards STEAM Approach	146	60	246	181.10	39.61	- 0.58	- 0.15

Table 4 shows the basic statistics of the group of the participants. All the participants in the study scored on self-efficacy towards STEAM approach in education. As can be seen from Table 4 that the nature of data is moderately normal. Therefore, parametric statistics was used to analyse the data. Ergo, according to the nature of data, the statistical technique of t- test was used to analyse the data.

used to analyse the data. Ergo, according to the nature of data, the statistical technique of t- test was used to analyse the data.

As the statistical values in Table 4 show, it is clearly apparent that SD value of self-efficacy towards STEAM approach in education is 39.61 for mean 181.10 which is approximately one-fifth to mean value and even the mean value 181.10 is greater than the average value on the neutral point of the 5-point Likert scale provided by the participants, i.e., 150. In addition, the value of skewness of the distribution is –0.58 lying between the –1.00 and +1.00 that indicates that distribution is negatively skewed and maximum observations are lying into the right side of normally distributed curve. After converting the raw scores with the use of M and SD, the range of the scores for three groups was decided as presented in the Table 5 given below.

TABLE 5

Level of Teachers' Self-Efficacy Towards STEAM Approach in Education (N=146)

Level of Teachers' Self-Efficacy	*Below 142 (Low)*	*Between 142 & 220 (Average)*	*Above 220 (High)*
No. of Participants	29	91	26
Percentage (%)	19.88	62.32	17.80

As can be seen from the Table 5, 62.32 per cent of teachers' have shown the average level of self-efficacy towards STEAM approach in education, whereas 19.88 per cent of teachers showed a low level of self-efficacy toward STEAM approach in education. Further, Table 5 also depicts that only 17.80 per cent of teachers' have shown the high level of self-efficacy toward STEAM approach in education. Ergo, it reveals that most of the participants have shown an average level of self-efficacy towards STEAM approach as shown in Table 6.

TABLE 6

Mean, Sd and T Values on Teachers' Self-Efficacy (Types of Teachers)

Variable/ Dimensions	*Teachers (IST/PST)*	*N*	*M*	*SD*	*t-value*	*p-value*
Instructional Strategies	IST	43	74.06	15.40	2.14*	<0.05
	PST	103	66.00	17.70		
Classroom Management	IST	43	43.50	9.60	1.97*	<0.05
	PST	103	39.20	11.00		
Student Engagement	IST	43	70.80	16.50	1.73	NS
	PST	103	64.50	16.70		
Total	IST	43	188.50	34.40	2.15*	< 0.05
	PST	103	169.90	41.80		

** - Significant;* NS - Not Significant

It is evident from Table 6 that the obtained t values ($t = 2.14, 1.97$ & 2.15; $p < 0.05$; $df = 144$) were found to be significant for teachers' self-efficacy towards STEAM approach in education except only student engagement dimension with respect to type of teachers. It indicates that in-service teachers (IST) have shown high degree of self-efficacy towards STEAM approach in education than pre-service teachers (PST).

TABLE 7

Mean, Sd and T Values on Teachers' Self-Efficacy (Gender)

Variable/ Dimensions	*Gender (M/F)*	*N*	*M*	*SD*	*t-value*	*p-value*
Instructional Strategies	M	76	72.68	19.04	0.50	NS
	F	70	70.80	14.57		
Classroom Management	M	76	42.34	11.08	0.75	NS
	F	70	41.80	9.83		
Student Engagement	M	76	68.26	17.76	0.73	NS
	F	70	67.31	15.43		
Total	M	76	183.29	43.78	0.61	NS
	F	70	179.91	35.84		

** - Significant;* NS - Not Significant

As can be seen from Table 7, the obtained t values ($t = 0.50, 0.75, 0.73, 0.61$; $p > 0.05$; $df = 144$) were not found to be significant for teachers' self-efficacy towards STEAM approach along with its dimensions namely instructional strategies, classroom management and students' behaviour with respect to gender. It indicates that gender difference does not exist with respect to self-efficacy towards STEAM approach, i.e., male and female teachers have shown the similar extent towards the use of STEAM approach in education.

TABLE 8

Mean, Sd and T Values on Teachers' Self-Efficacy (Stream)

Variable/ Dimensions	*Stream*	*N*	*M*	*SD*	*t-value*	*p-value*
Instructional Strategies	Science	66	72.55	17.63	0.49	NS
	Humanities	80	71.15	16.57		
Classroom Management	Science	66	43.94	10.60	1.97*	< 0.05
	Social science	80	40.55	10.16		
Student Engagement	Science	66	70.09	17.30	1.51	NS
	Social science	80	65.93	15.92		
Total	Science	66	186.58	41.46	1.34	NS
	Social science	80	177.63	38.67		

** - Significant;* NS - Not Significant

As the statistical values in Table 8 show, the obtained t values ($t = 0.49, 1.51, 1.34$; $p > 0.05$; $df = 144$) were found to be not significant for teachers' self-efficacy towards STEAM approach with respect to subject stream (science and social science) except only classroom management dimensions ($t = 1.97$; $p < 0.05$; $df = 144$). It indicates that stream wise difference was not found in the teachers' self-efficacy towards STEAM approach in education.

TABLE 9

Mean, SD and t Values on Teachers' Self-Efficacy (Locality)

Variable/ Dimensions	*Stream*	*N*	*M*	*SD*	*t-value*	*p-value*
Instructional Strategies	Rural	54	68.07	17.90	2.03*	< 0.05
	Urban	92	73.96	16.18		
Classroom Management	Rural	54	40.00	11.29	1.85	NS
	Urban	92	43.30	9.81		
Student Engagement	Rural	54	65.11	18.18	1.50	NS
	Urban	92	69.39	15.54		
Total	Rural	54	173.19	43.80	1.98*	< 0.05
	Urban	92	186.65	37.05		

** - Significant;* NS - Not Significant

It is evident from Table 9 that the obtained t values ($t = 2.03, 1.98$; $p < 0.05$; $df = 144$) were found to be significant for teachers' self-efficacy towards STEAM approach and its instructional strategies dimensions with respect to locality. It reveals that institutional difference does exist in the teachers' self-efficacy towards STEAM approach. The teachers with urban background have shown the high degree of self-efficacy towards STEAM approach than their counterpart.

TABLE 10

Mean, SD and t Values on Teachers' Self-Efficacy (Type of Institutions)

Variable/ Dimensions	*Stream*	*N*	*M*	*SD*	*t-value*	*p-value*
Instructional Strategies	Central	107	71.48	17.28	0.36	NS
	State	39	72.62	16.43		
Classroom Management	Central	107	41.62	10.25	0.89	NS
	State	39	43.36	11.08		
Student Engagement	Central	107	67.09	17.21	0.86	NS
	State	39	69.77	14.98		
Total	Central	107	180.19	41.26	0.74	NS
	State	39	185.74	36.79		

** - Significant;* NS - Not Significant

As we can see from Table 10, the obtained t values ($t = 0.36, 0.89, 0.86, 0.74$; $p > 0.05$; $df = 144$) were found to be not significant for teachers' self-efficacy towards STEAM approach with respect to type of institutions (central and state institutions). It reveals that institutional difference doesn't exist in the teachers' self-efficacy towards STEAM approach. The teachers and pre-service teachers from central institution and state institutions have shown the similar degree on teachers' self-efficacy towards STEAM approach in teaching-learning process.

Qualitative Data Analysis

After analysing the response of the participants, it was found that:

(i) 90 per cent of participants pointed out that STEAM approach in education offers several advantages like hands-on experience in classroom, holistic learning, encourage creativity and innovation, collaboration, teamwork, equal opportunity and inclusivity.

(ii) 60 per cent of participants pointed out the lack of teachers' attitude towards STEAM approach in education, lack of integration of STEAM regarding effective use of teachers' self-efficacy for quality education.

(iii) 95 per cent of the participants pointed out the lack of training of teachers' professional development as per the rapid change in the use of ICT in education sector.

(iv) 80 per cent of participants (pre-service teachers) suggested that curriculum and assessment procedure must be aligned based on STEAM activities and accordingly teachers should be trained for the same.

(v) 40 per cent of participants indicated the need of awareness of parents and society towards use of STEAM based activities in education.

Discussion and Conclusion

Despite the call for integrated STEAM education at every spectrum of education, educational researches that have investigated teachers' self-efficacy and attitudes regarding STEAM in education are sparse yet. The findings of this study reveal that that only 17.80 per cent of teachers have shown the high level of teachers' self-efficacy towards STEAM in education whereas 62.80 per cent of teachers showed average level of self-efficacy. On the other hand, Geng, Jong and Chai (2018) reported that 5.53 per cent of the respondents regard themselves as 'well prepared' for STEAM education. It is concluded that few teachers have shown high level self-efficacy towards STEAM approach in education along with its dimensions namely instructional strategies, classroom management and student engagement. Further, the study reveals that gender, stream and institutions differences were not found in the self-efficacy of teachers towards STEAM along with its all dimensions. The findings of the study were not found consistent with the findings of Srikoom and Faikhamta (2018). They reported that gender and experience of teachers of in-service teachers influenced their self-efficacy and attitude about STEM education. On the other hand, they also reported that 29.67 per cent of in-service teachers perceived that STEM activity is the time-consuming activity and course. Prior research has suggested that women tend to underestimate their competency and interest in STEM due to the social notion that men have better abilities in these fields than women (Bong, 1999). Furthermore, the study reveals that a significant difference was found based on types of teachers and locality with respect to teachers' self-efficacy towards STEAM approach in education and favoring to in-service teachers and urban teachers respectively. It may be the reasons that in order to provide the STEAM based training for in-service teachers, different initiatives are being taken by the Ministry of Education, Government of India in the light of National Education Policy 2020. Ergo, in-service teachers have shown a higher degree of self-efficacy towards STEAM approach in education than their counterparts. Furthermore, it is also reported that STEAM approach provides the opportunity for learners in terms of hands-on experience, holistic learning, encourage creativity and innovation, collaboration and teamwork, and equal opportunity and inclusivity. It is informed by the participants that urgent promotion of STEAM education and professional training of teachers are needed to align the curricular and assessment aspects based on STEAM activities (Tyagi & Gupta, 2021; Geng *et al*, 2018). In addition, there is a need to align the curricular and assessment practices based on STEAM activities (NEP 2020; Srikoom & Faikhamta, 2018). Besides the above, awareness of parents

and society for the same helps to achieve the goal of integration of STEAM in education (NEP, 2020). Finally, the findings of the study reflect that there is an urgent need to organize articulated professional development of teachers in terms of pedagogic support, and curricular resource for implementing STEAM education in practice.

Implications of the Study

Previous research shows that teacher efficacy is a strong indicator of a teacher's ability to be successful in the classrooms. Therefore, in case of lack of teachers' self-efficacy, development of pre-service coursework and in-service workshops specifically devoted to STEAM education play a pivotal role to improve their teacher efficacy and effectiveness in the classroom. The findings of the study have direct implications to researchers and policy planners for reforms in education like how to integrate STEAM in education and propose a model of STEAM education as inter and transdisciplinary research keeping in mind of the importance of Bharatiya Gyan Parampara. In order to achieve the target for implementation of STEAM in education, STEAM professional development programme for teachers and awareness programme for administrators should be conducted at mass level that encourages teachers to use STEAM based teaching-learning process and connecting the institution with community and industry. Further, it is also informed by the participants that STEAM specific workshop and providing suitable instructional and learning materials such as textbooks and guidelines for developing syllabus and curriculum will be helpful resources for them to improve the quality of enacting STEAM approach into classroom and include the STEAM-based learning outcomes in teaching-learning process. Finally, it is suggested that STEAM perspective-oriented training should be provided to teachers and teacher educators for preparing the prospective teachers and 21st century learners to perform nationally and globally.

Limitations of the Study

Despite having a degree of methodological strength, the present study has some limitations also which are as below: (i) Data had been collected through online mode; therefore, there is a probability of lack of accuracy and authenticity of collected information; (ii) Sample size was small; therefore, generalisation of research findings may face difficulty; and (iii) Due to the administration of a self-reporting questionnaire on the participants, the probability may increase to provide the overestimated and socially accepted responses on the items. Therefore, triangulation techniques like situation-based items, focus group discussion with teachers and interaction with students may capture the exact picture of teachers' self-efficacy toward STEAM approach in education.

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Journal of Educational Planning and Administration
Volume XXXVII, No. 4, October 2023, pp. 361-364

Book Reviews

KUMAR, Krishna (2021): ***Smaller Citizens: Writings on the Making of Indian Citizens***, Orient Blackswan, ISBN: 9789354420901 (Paperback), pp.149, ₹ 395.00

Professor Krishna Kumar's seminal book *Smaller Citizens* is a compendium of his 18 selected works, published and featured in different formats (such as opinion pieces, lectures, academic articles, working papers, etc.) and on different platforms. The book offers a riveting format and transgresses themes, timelines, geographies and contexts. In addition to being a commentary on some critical issues of education in India, the book is also experimental in its thematic, methodological and anecdotal approaches. The people of India and their stories are at the heart of Krishna Kumar's writing style where he uses the mundane to guide you to the profound. His work keeps the criticality of history, experiences and context as the focus. This book review aims to provide a succinct overview of the contents of this book and then proceeds to offer a critical analysis of four key themes emerging from the text. The review also seeks to highlight its contemporary relevance and also some limitations of the book.

To briefly summarise, this book explores the intricate relationship between nation-building, citizenship and education in India. In highlighting some interesting interlinkages between the formation/functioning of the state and the Indian education system, Professor Kumar repeatedly refers to the rigidity, control and hierarchy exercised by the state, and how it has shaped the modern education system in the country. He asserts that education cannot be seen as independent of the ethos of society, and stresses on the need to inculcate free and critical thinking among students and teachers. The essays, while written in different time zones and milieus, exhibit some recurring themes such as childhood, girlhood, curriculum, teachers, modernisation, rurality, equality, nationalism, identity, citizenship, child rights, bureaucracy, peace, etc. The next section is a deep dive into some of these themes.

The book begins with a critical examination of childhood, both as an analytical category and as a lived experience. It emphasises the isolation and underdevelopment of childhood as an analytical category in India (especially in academic institutions), leading to an over-reliance on global discourses, which is context-agnostic and culturally misfitting. He alludes to the consequential methodological and pedagogical limitations resulting from this inattention. Krishna Kumar highlights the disparities in childhood experiences within India and challenges the 'essentialist view' of childhood's role in citizenship and national development. He particularly focusses on girlhood, showcasing the complexities within seemingly homogenous categories of childhood. Girls in education face constant contradictions and fears, and are conditioned to fit into culturally moulded identities. He also asserts that a deeper understanding of India's political history, including India's tryst with

modernity, rurality, class and caste is critical to understanding childhood in India. The essays also underscore the disconnect between pedagogical and curricular aspects and a child's daily experiences, with teachers facing substantial challenges due to this gap. He draws attention to the perils of adolescents in the Indian education system who suffer greatly from unequipped schools, hyper-focus on exams, societal pressures, and limited scope for critical dialogue, thereby contributing to the distress of this critical age group. Professor Kumar warns about the changing socio-technological landscape in India, where children are increasingly exploited by and for global markets, making them more vulnerable, and leaving little agency to be exercised by parents and teachers. The book then deals with the theme of child well-being and rights**,** where Professor Kumar critically examines the rights-based discourse on education in India and its limitations. He discusses the cultural influence on state legislative action and the need for reflection on social constraints. The Right to Education (RTE) Act is seen as a significant step, but challenges persist in shifting the entrenched discourse. The implementation of RTE necessitates 'professional insight' and training for teachers and administrators, as well as resistance against legislation by non-state school providers. Child rights infringements such as corporal punishment are also addressed, highlighting the weak child protection apparatus in India. Throughout these discussions, the inadequacy of preparedness among key stakeholders tasked with safeguarding children's rights, safety, and well-being is a recurring theme.

The next big block of emphasis in Prof. Kumar's work is on the state, nationhood and citizenship**.** A substantial portion of the book explores the interconnected concepts of state, nationhood, citizenship and education. A deep understanding of history and the state is a virtuosity of Professor Kumar, which is well-reflected in this compendium. He delves into India's history, from colonial influences to indigenous efforts in the nation-building process. He argues that the Indian education curriculum promotes nationalistic identities and religious identities. The role of home and family in shaping a child's identity is discussed, emphasising that a sense of belonging (or not belonging) to a community is instilled early at home and in schools. The teaching of history and knowledge about the state's functions reinforce nationalism. Professor Kumar advocates for peace education and a critical re-design of curricula and pedagogical practices. He underscores the importance of nurturing the child's agency and encouraging reflection on their experiences. Additionally, he suggests greater use of arts and vocation in education.

The next strand of Professor Kumar's scholarship relates to an understanding of the post-welfare state, modernity and development. He provides a critique of the Nehruvian era of Indian development, which greatly deprioritised school education. He asserts that despite a right-based approach and a clear need for educational quality, the state is seen to be shirking its responsibility. The infiltration of non-state providers has reduced the state's financial commitment; led to poor training and working conditions of teachers; resulted in weak enforcement of RTE and backed up the neoliberal approaches to education.

Professor Kumar then moves on to discuss modernity. The book includes essays on education and about modernisation and globalisation in India. Within this field, Professor Kumar walks the readers through the underbelly of intricate concepts like rurality, urbanism, caste, poverty and identity, and their reflection in the modern Indian education systems. One could see the soft spot which Professor Kumar has for rural India and the need to regard and preserve it. He also traces the impact of colonisation on modernization in

education. He argues for the preservation of authentic rural existence and criticises the approaches that undermine rural India's resilience. Professor Kumar also discusses how caste, poverty and identity continue to manifest in the education system. Caste-based discrimination is often overlooked as a curricular taboo, while poverty affects students' educational experiences due to a lack of stability in nutrition, occupation and health. The state's failure to adapt the education system to the socio-economic and cultural realities of identity groups like tribals is also addressed. Offering a silver lining, he believes that teachers can make a substantial difference in improving the educational experiences of disadvantaged children. Throughout these discussions, the state's assumption that issues like caste, poverty and diversity impede modernisation in India is a recurring theme. Technology adoption in education is also cautiously examined, with a warning of its potential ramifications.

While written in different time zones, the overall contents of the book carry some important contemporary reflections and applications. The compendium of essays, while independent of each other, shows many conceptual and thematic overlaps. Even within the broad themes, one can find deep synergies and interconnectedness. The recurring use of a historical lens in education, the use of narratives/anecdotes and deep traces of colonial and post-colonial approaches are some of Professor Kumar's quintessential style, fragrance of which can also be found in this book. What also sets this scholarship apart is his ability to show candidness in dealing with sensitive and critical issues like gender, caste, identities, etc. However, some other intersectional themes such as sexualities, disability, linguistics, etc. (while rapidly evolving academically/conceptually) find little place in this volume of his work. References and takeaways from the philosophies of thinkers like Dewey, Gandhi, Tagore, Leela Dube and Devi Prasad adds to the gravitas as also the flavour of analysis.

The book also provides scope for empirical and methodological innovation (chapter 9), especially in viewing education as a critical field of inquiry and not just practice. Professor Kumar maintains a stronghold in a transcendental as well as micro understanding of curricular and pedagogical aspects of Indian education. A few of the essays in the book allude to the need for curricular re-imagination as well as improving the lives and working conditions of teachers in India. He makes recurring references to the National Curriculum Framework (NCF), Comprehensive and Continuous Evaluations (CCE), teacher education and teacher training, etc. This focus has been repeatedly reflected in decades of his work and comes across as an important site of advocacy and reform.

While this work includes the need for policy, legal and governance changes in education, this remains to be a secondary focus in his writings. A deeper engagement with state-based reforms could offer implications for the effective implementation of the RTE Act and a critical assessment of the recently released National Education Policy (NEP), 2020 in his future work. Nevertheless, his writings reflect his knack and ability to predict futuristic implications on education. In many such instances, he presents the readers with tales of caution for the future, which are dangerously becoming true in this rapidly changing India. His essays critically reflect the infiltration of technologies in education, and its impact on childhood, child well-being and learning. There is a need to view these issues with much greater caution in contemporary times where there is an increasing prioritisation of technology in education, by state and non-state actors. Similarly, he also hints at the risks of adopting a market-based, outcome-focussed, consumption-centric, and efficiency-oriented

approach to education, which is increasingly being propagated by civil society, interventionists and other education/managerial experts. He probes us to go beyond the apparent numbers and statistics on education and explore the cultural and social nuances to understand the problem. Critically, he highlights the need to bring back attention to rural education and bestow it the much-deserved autonomy and recognition. In a unique insight, he also evokes some interesting parallels between health and education in India, and how it has been politically and financially de-prioritised by the state.

Particularly relevant in today's times are his writings on the need for peace education in India. He asserts that the education of today's time is closely linked to war and violence. There is an increasing tendency to belittle the relationship between peace and education, and the same must be revisited. The India of today is incessantly moving towards competition, rapid development, globalisation, consumeristic and techno-centric worldviews. Education delivery, being closely interconnected to the socio-political developments, is bound to be impacted by it. In a world of chaos and uncertainty, his message for peace, freedom, child individuality and teacher autonomy can create ripples of change and sustenance. In addition to aiding the normative construction of the aims of education, these concepts can also offer practical solutions for curricular and pedagogical innovations. Such an approach can also help in strengthening India's weak apparatus of childhood and child protection, which is an emergent priority.

To conclude, in this seminal work, Professor Kumar offers us a critical lesson about using history to understand the present, especially in education. Through this collection of meticulously written essays, he challenges the readers to see beyond the obvious, and move away from the tendencies of viewing education only in terms of instrument and practice. He begins his walk from India which was under colonial rule, to an India where Artificial Intelligence and machine learning have entered into educational spheres. He connects everyday educational realities to labyrinthine forces of state, citizenship, and nationalism, and makes an indelible contribution to scholarship on the Indian education system. In a more scholarly focus, the book's multidisciplinary approach and insightful analysis make it a valuable resource for understanding the intricate relationship between childhood, education, citizenship and nation-building in India. It boldly challenges the existing paradigms and offers thought-provoking perspectives on contemporary challenges. It also underscores the urgent need for policy changes and a deeper commitment to improving the well-being and rights of children in India.

National Institute of Educational Planning and Administration (NIEPA),
17-B, Sri Aurobindo Marg, New Delhi - 110016

Pooja Pandey
poojapandey@niepa.ac.in

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Contents of Volume XXXVII (2023)

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Contents of Volume XXXVII (2023)
Vol. XXXVII No. 1 (January 2023)

ARTICLES

BOOK REVIEWS

Vol. XXXVII No. 2 (April 2023)

ARTICLES

BOOK REVIEWS

Vol. XXXVII No. 3 (July 2023)

ARTICLES

BOOK REVIEWS

Vol. XXXVII No. 4 (October 2023)

ARTICLES

BOOK REVIEWS

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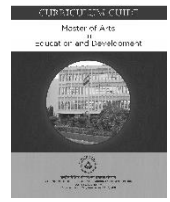

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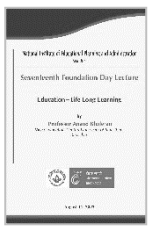

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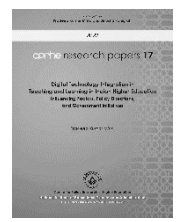

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ADMISSION NOTICE 2024-25
(i) PhD (Full-time) Programme (ii) PhD (Part-time) Programme

The National Institute of Educational Planning and Administration (NIEPA) is a Deemed to be University, fully funded by Ministry of Education, Government of India. It is engaged in research and capacity building in Educational Policy, Planning and Administration.

The NIEPA offers PhD (Full-time and Part-time) programmes in all area of Educational Policy, Planning and Administration from a broader inter-disciplinary social science perspective. The Doctoral research programme of the NIEPA covers all levels and sectors of education, and it is holistic and multi-disciplinary in its perspective, and is inclusive of comparative and international approaches to education. The NIEPA has an excellent teaching faculty, with expertise in various area of education, policy, planning, management and with disciplinary backgrounds in the social sciences. The faculty has expertise in leading national and international research.

In due recognition of its institutional strength, the NIEPA has been awarded an "A" grade by the NAAC.

Eligibility Criteria for Application to the Doctoral Programme:

3.1 PhD (Full-Time)

Candidates who have completed:

(a) 1-year/2-semester master's degree programme after a 4-year/8-semester bachelor's degree programme in Social Sciences and allied disciplines or a 2-year/4-semester master's degree programme after a 3-year bachelor's degree programme in Social Sciences and applied disciplines or qualifications declared equivalent to the master's degree in Social Sciences and allied disciplines by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed.

Or

Equivalent qualification from a foreign educational institution accredited by an assessment and accreditation agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of the educational institution.

A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-Abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the UGC from time to time.

Provided that a candidate seeking admission after a 4-year/8-semester bachelor's degree programme should have a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed.

(b) Candidates who have completed the MPhil programme with at least 55% marks in aggregate or its equivalent grade in Social Sciences and applied disciplines in a point scale wherever grading system is followed or equivalent qualification from a foreign educational institution accredited by an assessment and accreditation agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of educational institutions, shall be eligible for admission to the PhD programme. A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-Abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the UGC from time to time.

(c) Candidates who are yet to clear their final examination at the master level are also eligible to apply provided they have passed the examination as per the eligibility conditions laid down in the regulation in previous semesters and submit its proof at the time of final admission. In case, because of delay in examination, a candidate fails to provide the

Cont....

proof of minimum eligible marks, an extension of six months from the date of submission shall be given by the DPC, failing which the admission of such candidate shall be cancelled.
(d) Those candidates who have qualified NET and have been awarded Junior Research Fellowships by the UGC, with the above-mentioned educational qualifications can also apply.

3.2 PhD (Part-time)

(a) PhD programmes through part-time mode will be permitted, provided all the conditions stipulated in these Regulations are fulfilled.
(b) The candidate for a part-time PhD programme shall submit a "No Objection Certificate" from the organization where the candidate is employed, clearly stating that:

i. The candidate is permitted to pursue studies on a part-time basis.
ii. His/her official duties permit him/her to devote sufficient time for research.
iii. If required, he/she will be relieved from the duty to complete the course work.

Note: It will be compulsory to attend one-year full-time course work for all part-time and full-time scholars.

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Initial short-listing of applications will be carried out on the basis of the eligibility criteria mentioned above. Short-listed candidates will be required to appear for a written test on **June 08, 2024**. Candidates who qualify in the written test, will be invited for a personal interview, to assess their potential. A weightage of 70% for the entrance test and 30% for the performance in the interview/ viva-voce shall be given. A final list of selected candidates will be in order of merit.

The NIEPA follows all mandatory provisions with respect to reservation policy of the Government of India. Admissions to PhD (Full-Time and Part-time) programmes are made purely on the basis of merit following the prescribed criteria of the Institute, and following rules of reservation of the Government of India.

The NIEPA reserves the right to decide the number of seats to be filled in the year 2024-25, the criteria for screening of applications; and the selection procedure of candidates for admission to its PhD programmes.

How to Apply

Candidates should apply online through Samarth Portal in the prescribed online form for admission to PhD programmes of the Institute. The link is available at NIEPA website i.e. https://niepaadm.samarth.edu.in/. For further details, please refer PhD Prospectus, 2024-25 of the NIEPA available at the website **www.niepa.ac.in**

A non-refundable sum of Rs. 800/- (Rs. 400/- for SC/ST/PWD and EWS candidates), through online payment, as application fee is mandatory for seeking admission for the above programme. The hard copy of Prospectus can be obtained from NIEPA, if required after filling the online form.

Last Date for submission submission of Application

Online application should be submitted by on or before **May 15, 2024**.

1.	Starting date for Call for online application	March 15, 2024
2.	Last date for online application	May 15, 2024
3.	Written test	June 08, 2024
4.	Interview	June 13-14, 2024
5.	Declaration of final results	June 20, 2024
6.	Date of admissions	July 3-4, 2024
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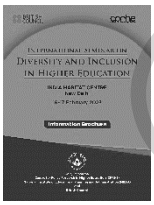

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