

Impact of Multiple Entry & Exit System on Future Engineering Education in India – Theoretical Perspectives

A.K. Damodaram¹, L.Venkateswara Reddy², U. Ravindra Babu³, M. Mohan Babu⁴

¹ Professor, Department of Mechanical Engineering, Sri Venkateswara College of Engineering & Technology, Chittoor, AP - India.

² Professor, Department of Computer Sci. & Engg., KG Reddy College of Engineering & Technology, Hyderabad, Telangana, India.

³ Assistant Professor, Department of English, Sree Vidyanikethan Engineering College (Autonomous), Tirupati, AP, India.

⁴ Professor, Department of Civil Engineering, Sri Venkateswara College of Engineering & Technology, Chittoor, AP, India.

¹akdamodaram988@gmail.com,

²lakkireddy.v@gmail.com,

³uppala.r@gmail.com,

⁴matammohan@gmail.com

Abstract : Impact of Multiple Entry & Exit System on Future Engineering Education in India – Theoretical Perspectives Being aware that the Indian education system is undergoing a comprehensive transformation because of the implementation of the third major National Education policy-2020, a third major educational policy. Higher education, in particular, engineering education is not an exception to this. As a major policy envisage, the Multiple Entry & Exit (MEE) system is being implemented in higher education expected to have a significant impact on engineering education in India. The MEE gives emphasis on authorizing 'academic flexibility' to the student in the choice of subjects for the programs that lead to an award of a certificate, diploma & degree, and 'academic pathways' that allow the student to exit and rejoin the program at later stages without losing credits gained for the courses already completed. The

policy envisions expected to transform the future higher education system, including engineering education, especially permitting the student to exit the program at the end of the first, second, or subsequent year of the program of the study, and rejoin at later stages either within the same engineering institution or other engineering institutions allowing seamless student mobility between or within the engineering institutions. Through a system of credit recognition by the statutory bodies, credits accumulation through an academic bank of credits (ABC), transfer of credits across the engineering institutions, and redemption of the credits to recommend an award of certificates, diplomas, degrees, 'MEE' system will be a game-changer in engineering education. The article discusses the policy focus on the 'MEE' and its impact on future engineering education in India.

Key Words: Higher education; Education transformations, Multiple Entry & Exit; Education Policy.

1. Introduction

The Indian higher education is gearing up for a major revamp with the implementation of the National Education Policy-2020 (NEP-2020). Asia and the Middle East, in the recent past, have strengthened their higher education system by imbibing the best practices of the global higher education system and establishing a friendly

A.K. Damodaram

Professor, Department of Mechanical Engineering,
Sri Venkateswara College of Engineering & Technology,
Chittoor, AP - India.
akdamodaram988@gmail.com,

ecosystem that caters to the needs of global higher education demands. These efforts significantly reduced the migration of students' wishes to pursue higher education in 'Western' Countries. Also, several reputed Universities across the World established International Branch Campus (IBS) in foreign locations have increased significantly, especially in Asia and the Middle East (Lane, J. E. 2011). The number of students migrating to the Middle East in the recent past can be attributed to the globalization of higher education, accessibility to eminent global Engineering education institutions through offshore campuses, migration & Visa support, etc., The National Education Policy-2020, being implemented in phase-wise in India emphasizes efforts of engineering institutions toward imbibing global standards in higher education, and transform into premier higher education's institutions globally. The policy envisions are perceived as a game-changer in higher education, especially UG and PG engineering education in regions of Asia and the Middle East, shall have a significant impact globally. The major policy envisions the Multiple Entry & Exit (MEE) system is expected to have a key impact that endorses flexibility to the students pursuing higher education not only in the choice of subject of study leading to the award of degree but also the flexibility to exit a program at the first, second, third or subsequent years and rejoining the program either at the same engineering institution or at other engineering institution in India or abroad. The MEE system is will also have a profound impact on student enrollment for higher education in Indian engineering institutions and foreign engineering institutions. Research in educational systems is very low compared to its quantum (Teichler, U.2015). Owing to the impact of the important policy envision, the present article discusses the impact of MEE on future engineering education in India.

1.1 The policy background:

The third major revamp of educational policy in India National Education Policy-2020 (NEP-2020) has come into force in August 2020. The new policy intended to reform education in India was put together on four pillars namely, Access, Equity, Affordability, and Accountability of education to the citizens of India (V., Kannan. 2021). The major objective of the policy is quality in education, adoption of innovation & research that promise India to become a knowledge superpower by enhancing the necessary skills in its students. Also, to curtail the shortages in manpower in Science & Technology, Industry, and academia. The

major objectives of the Policy in terms of flexibility for the students are to increase Gross Enrollment Ratio (GER) and to provision flexible Learning paths that allow the student to avail multiple entries into and exit from the program.

1.2 Engineering Education in India-

As per the survey 'All India Survey on Higher Education (AISHE)' by Ministry of Education, Government of India, reported that with 19 sub-streams, Engineering & Technology stream enrolled 52478 students for Ph.D. (Doctoral programs), 1.77 Lakhs Students at PG level during AY 2019-20. Also, during the same academic year, around 8.2 lakh students passed UG programs in engineering & technology. Table 1 shows there are 3.72 Million student enrollment in total for UG&PG Engineering in 2019-20.

**Table 1 : UG & PG Enrollments 2019-20
(As per AISHE Survey Report-2021)**

Discipline	Male	Female	Total
Computer Engineering	578877	356393	935270
Mechanical Engineering	644707	40219	684926
Electronics Engineering	356509	254933	611442
Civil Engineering	375134	109033	484167
Electrical Engineering	271455	101845	373300
Other Engg., & Tech.,	150576	69344	219920
Information Technology	122048	78655	200703
Architecture	39725	43971	83696
Chemical Engineering	40085	12110	52195
Agriculture Engineering	14652	8009	22661
Aeronautical Engineering	14284	4410	18694
Food Technology	7787	5750	13537
Metallurgical Engg.	7694	2263	9957
Mining Engineering	6692	336	7028
Marine Engineering	4972	374	5346
Dairy Technology	2403	932	3335
Planning	485	523	1008
Total	2638085	1089100	3727185

1.3 Context of NEP-2020: Quickly changing landscape of employment and global ecosystem of engineering education forced the policymakers to completely revamp Indian higher education system. The policy envisions in NEP-2020 aims at making learning with critical thinking, problem-solving, and creativity with a multi-disciplinary approach right from the school education. The policy is presumed to be a bridge between the current status of learning outcomes and the future needs of higher education. NEP-2020 proposes a complete revision and revamp of education structure in all aspects including regulation and governance. Aiming to overcome some of the problems faced by the engineering institutions

in India, the policy enumerated the following current problems pertaining to higher education (NEP-2020 Document).

- a. Fragmented higher education ecosystem
- b. Very fragmented higher educational ecosystem
- c. Less emphasis on cognitive skills among the students and learning outcomes
- d. Narrow areas of study due to rigid separation of disciplines
- e. Inadequate access to engineering institutions
- f. Limited teacher and institutional autonomy

The main thrust of the NEP-2020 is transform engineering institutions into a large multi-disciplinary universities. The main motto of a university is cater the needs of quality manpower for competitive market of world economy (Krajewska, A., 2020). According to the policy, the definition of engineering institution is reframed as 'A university is a multi-disciplinary higher learning institution that offers both UG and PG programs with a quality teaching and community engagement. And as per the policy, an 'Autonomous College' is a large multi-disciplinary institution of higher learning that grants UG degrees – smaller than a typical university. It is proposed to phase out all affiliated colleges by 2030. All affiliated colleges are required to improve and shall transform into a vibrant multi-disciplinary autonomous engineering institution. Regarding GER, the policy aims at 50% by 2035 from 26.3% at present.

1.4 Higher Education & Globalization:

Globalization, in the recent past, profoundly increased the demand for education, especially higher education, engineering education in particular. Implications in this regard is an increase in engineering institution numbers locally, and globally. While considering future higher education, aspects of internationalization and globalization need to be given top priority (Marginson, S. et al., 2007). Globalization is a complex force that affects every aspect of life, and its importance cannot be denied. Higher education, in the recent past, have shifted from peripheral to a central position in the context of globalization (Ead, H. A. 2019). In the past years, all countries underwent a rapid transformation and

revamping of their education system, especially higher education. These transformations witnessed a significant improvement in 'rates of return' on higher education, resulting in an establishment, and empowerment of engineering institution to operate at the global standards. Private investments started flowing in into higher education considerably leading to hectic competition in student admissions and enhancing students' access to higher education institutions globally. Since India is the country with a potential to cater to the higher education needs globally, is undergoing transformational changes in its higher education system through envisions of the NEP-2020. The major policy envision in higher education is the 'flexibility to the students' in academic paths leading to the award of a certificate, diploma, and degree through 'Multiple Entry & Exit (MEE) System. The other policy envisions that support the MEE are 'Flexible Academic Paths', 'Academic Bank of Credits' (ABC), and targeted GER.

2. Higher Education with MEE:

Indian engineering institutions gearing up for effective implementation of multiple entry & exit systems endorsing flexibility to the students who pursue higher education. The following section deals with the major policy envisions in the context of MEE that is expected to impact engineering education transformation in the years to come.

2.1 Multiple Entry and Exit System:

The Major objective of the MEE system is to increase GER in Indian Engineering education institutions, curtailing the drop-outs in higher education, and Flexible learning to the students pursuing higher education. The students shall not lose the opportunity and right of 'learning' and the higher education institutions shall help them in getting a job and serve the nation (Damodaram, A. K., et.al 2021). The currently prevalent rigid boundaries in higher education making the student to stay with the program completely or give up the program if the student is unable to leave in between or mid-way shall be addressed by the MEE system. With the MEE system in action, the student can exit a program multiple times and make an entry again in the program either at the same engineering institution or at the different engineering institution with the flexibility to choose the subject along with transfer of credits the student already gained at the time of exit to the rejoining the program. This flexibility endorses the student an

opportunity to learn and gain diplomas, degrees, and certificates anywhere, any time. Also, MEE allows the student to choose subjects, minors, and creative combination of disciplines with flexible structures of curricula and combination of disciplines for their study.

2.2 Flexible Academic Paths as envisaged in the National Education Policy-2020:

In order to achieve high quality engineering education, there are several suggestion incorporated in the NEP-2020, which include changes in courses, teaching-learning methods, credit transfers, multiple entry and exit options etc., (NEP. 2020). Flexible academic paths as shown in fig.1 describes the

structure of higher education system after introduction of Multiple Entry and Exit system in Indian higher education system. Level 5 is the entry level at higher education system. Level 5 to level 7- Bachelors; Level 8 is Bachelors with an option to pursue honor's/research degree; Level 9 – Masters; and Level 10 is Doctoral programs.

2.2.1 Scope of MEE in Transforming Engineering Education: The MEE's prime objective is to provide academic flexibility and pathways leading to the award of certificates, diplomas, and degrees to students. Removing rigid existing boundaries for the students to choose and learn the subject of their choice. The MEE also facilitates 'lifelong learning' besides learning anywhere, anytime, any subject for

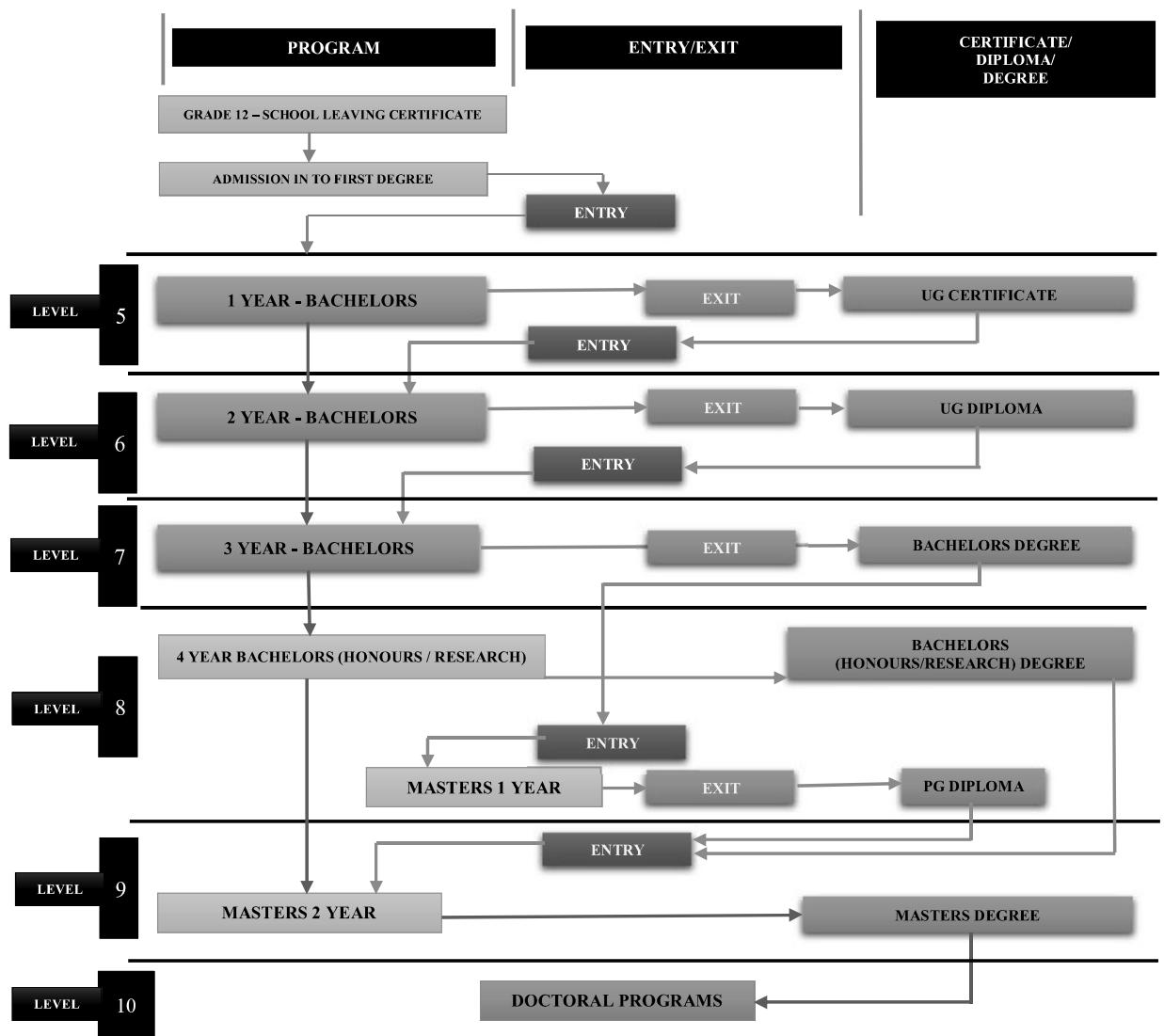


Fig. 1 : Academic Pathways in Multiple-Entry & Exit System (Author's own elaboration)

the students. It also facilitates the mobility of the students across the institutions with the help of the academic bank of credits (ABC). In a nutshell, the MEE provides a holistic and multidisciplinary higher education in the student's preferred major and minors. The MEE, overall, is expected to curtail the dropouts in higher education.

For engineering disciplines, MEE offers unique flexibility to pursue a master's program.

- I. A one-year master's program leading to a Master's degree for those students completing a four-year bachelor's program with dedicated research in their final year of study
- II. An integrated five-year dual degree (bachelor's and master's) with a choice to exit at the end of a third-year bachelor's degree and re-entry into a master's program in the same or other higher education institution.

The following are the salient features of MEE as envisaged in the policy.

- a. Facilitate new possibilities through suggested 'academic pathways' for learning
- b. Increase the 'Gross Enrollment Ratio (GER)' in engineering education institutions and limit dropouts
- c. Provision of 'progressive student learning' by recognizing the credits earned by the students
- d. Facilitate credit transfer for resuming learning within or other engineering institutions in India
- e. Facilitate student's mobility from India to foreign engineering institutions and vice-versa through transfer credits
- f. Authorize flexibility in designing different Master's programs that promotes employability 'globally'
- g. Endorse ample space for Internships, Industry exposure, learning by doing, etc., between the exit and entries into the programs
- h. Remove prevalent rigid brinks on student academic progress in the needy times when the student wants to give up and resume at a later stage.

- i. Facilitate students 'earning' in between the 'learning'
- j. 'Back to home' in needy times and 're-join' at a later time
- k. Endorsing employability opportunities with certificates and diplomas for those students who give up graduate/postgraduate education in unavoidable circumstances.

2.2.2 Test Cases for MEE:

It is evident that the student entering higher education at level 5 shall proceed through and gain a 'certificate' at the end of the first year, can obtain 'UG Diploma' at the end of second year, and a 'Bachelor Degree' after completion of third year. Also, there is a possibility to obtain honors/research degree if the student wishes to pursue fourth year which deals with a major project/research in the chosen field. As MEE gives scope for the student to exit at any year and shall resume the program at an appropriate time. With the obtained certificate, UG diploma or degree, the student can find suitable employment. The student is permitted to pursue further higher education at their convenient time later.

Case1:

Case 1: Level 5 to Level 7		
Completion of <i>First Year Bachelor's</i>	Certificate	Can progress to 2 nd Year Bachelor'
Completion of <i>Second Year Bachelor's</i>	UG - Diploma	Can progress to 3 rd Year
Completion of <i>Third Year Bachelor's</i>	Bachelor's Degree	Can Proceed to Master's Programs

Case 2:

Case 2: Level 8 for 3 Year Bachelors		
Completion of <i>1st Year Bachelor's</i>	PG Diploma	Can progress to 2 nd Year Master's

Case 3:

Case 3: Level 8 for 4 Year Bachelors		
Completion of <i>Fourth Year Bachelor's</i>	Honors/Research Degree	Can progress to 2 nd Year Master's

The students with Master's degree shall be eligible for joining doctoral programs.

Case 4:

Case 4: Entry within Level 4 and level 4 to Level 5		
<i>Completion of ITI</i>	<i>Can progress to 2nd Year Diploma</i>	
<i>Completion of Diploma</i>	<i>Can progress to 2nd Year Bachelor's in Engineering & Technology</i>	

The case 4 is already existing before NEP-2020 giving a scope to a student with a pass in ITI shall take

direct admission in second year of Diploma and student with a pass in Diploma shall take admission in second year of UG course in Engineering & Technology (Lateral Entry).

2.3 Academic Bank of Credits (ABC):

The new education policy proposes an 'Academic Bank of Credit' (ABC) that stores credit gained by the student 'digitally', to facilitate the students for banking academic credit gained by them at engineering institution in India. The ABC promotes academic credit banking, transfer, and redemption within the MEE framework. ABC is expected to integrate multiple disciplines of higher learning. In the framework of MEE, ABC endorses substantial academic autonomy to the students by providing choices of the courses in the selected program of study and course options across many higher education disciplines and engineering institution. The ABC also help the students in accruing credit required for the award of certificates, diplomas, and degrees by tracking the credit earnings. It shall be noted that, if any student redeems academic credits to gain a certificate, a diploma, and degree, such redeemed credits shall be deleted from the ABC facilitating the student to use certificate/diploma as the entry for resuming the studies. At present, the following conditions shall be fulfilled by the Engineering education institutions to get the eligibility to avail credit transfers.

- a. Grade A from the National Assessment and Accreditation Council (NAAC)

Or

- b. The National Institutional Ranking Framework (NIRF)- top 100 ranked institutions

Or

- c. NBA Accreditation with a minimum score of 675 for at least 3 programs being offered in the institutions

2.4 Gross Enrollment Ratio (GER):

GER in engineering higher education which is calculated between age group of 18-23 years in India. It is referred as the ratio of enrolment in engineering higher education institutions to the total population eligible age group between 18-23 in the country. The

NEP-2020 implementation aims at increasing GER from 26.3 % (2018) to 50% by 2035. It is observed that GER in Indian engineering institution is improving on a 'Year-On-Year' basis since 2015-16. Increment in the GER can be attributed to the increase in the number of engineering institutions in recent years. As per the AISHE report, out of 38.5 million enrollments, 79.5 % of students enrolled for UG programs while 11.2% enrolled for PG programs. In the academic year 2018-19, 37.4 Million Students enrolled in higher education in Indian engineering institutions, and the numbers raised to 38.5 Million in the academic year 2019-20.

3. Indian Higher Education System – Context of Global Higher Education:

3.1 Higher Education in India:

There are 11799 Institutions, 42343 Colleges and 1043 Universities are in India as on the academic year 2019-20. Among the Universities, 396 universities are privately managed, 17 universities are exclusively for women, and around 420 are located at rural areas of India.

3.2 Indian Students at Universities abroad:

Different factors drives student decision-making with regard to choosing education destination abroad. (Perez-Encinas, A., et al., 2021). A considerable number of Indian students were observed migrating to foreign universities for higher education in recent years. It is also observed that the number of students willing to join outside their home country is rising and is predicted to rise still further in future (Goodman et al., 2012). As of July 2021, more than one million Indian students migrated abroad as described in table 2.

Table 2 : Indian Students at Universities abroad.

Country	Number of Students	%
Australia	92383	8.05
Canada	230000	20.03
China	23000	2.00
Germany	20810	1.81
New Zealand	30000	2.61
Russian Federation	16500	1.44
Saudi Arabia	80800	7.04
United Arab Emirates (UAE)	219000	19.08
UK	55465	4.83
USA	211930	18.46
Other Countries	168141	14.65
Total	1148029	100.00

Source: Data from revealed documents of Ministry of External Affairs, Government of India)

3.3 Foreign students in Indian Universities:

As per the All India Survey on Higher Education (AISHE) conducted by ministry of education, with the Department of Education, Government of India, a total 49, 348 foreign students are pursuing higher education in Indian universities. The countries from which students migrate to India are Nepal, Afghanistan, Bangladesh, Bhutan, Sudan, United States, Nigeria, Yemen, Malaysia, and UAE. Around 74.3% of students are enrolled in UG programs while around 16.6% are in PG programs. The major enrollment of foreign students in India is into B. Tech., (Bachelor of Technology) in Indian engineering institutions followed by B.Sc., (Bachelor of Science). In the recent past, 1000 students from the Association of Southeast Asian Nations (ASEAN) joined the Indian Institutes of Technology (IITs) for Integrated Ph.D. programs. India's priority 'Neighborhood First' development partnerships, is extending educational opportunities for people from neighboring countries like Afghanistan, Bangladesh, Myanmar, Nepal, Sri Lanka, Maldives, and Mauritius. Indian Technical and Economic Cooperation (ITEC) is providing capacity-building programs for more than 160 countries has contributed to more than 2, 00, 000 professionals so far. India is admitting students from 57 countries for Engineering, Medicine, Management, and other professional courses into its various educational institutions (MEA Annual Report, 2021).

4.0 MEE - Impacts on Engineering Education – Discussions:

MEE introduced in Indian Engineering education institutions shall have considerable impacts on enrollment in engineering education institutions within India and globally with unprecedented change in students migrating from, and to India. The policy envisions has a profound impact on global higher education trends in the Asia region. According to Dodds A et al., (2008), among the contemporary researchers, in general consensus, globalization affects Higher education institutions rather than later being implicated in promotion of globalization.

Despite of abundance of resources, for any country, there shall be a paucity in development due to deficiency in human development (Naik, Naik BM 2020).

4.1 Gross Enrollment Ratio (GER):

Improving GER in Indian universities gives scope for moderate to high improvements in GER of global engineering institutions. Efforts of increasing GER in bachelor's programs give rise to an increase in the number of students migrating to foreign countries for higher education. Students while choosing the engineering institutions in their home country, their cognitions, motivation, and behaviors match to the affordance of instructional context. (Volet S, 1999).

Impact: GER will increase in Indian Engineering Education Institutions resulting in a considerable increase of GER in popular foreign education destinations like the USA, Europe, and the Middle East.

4.2 Academic Bank of Credits (ABC)

Since efforts are being undertaken to recognize, transfer, the redemption of 'Academic Credits' gained by the students in Indian Engineering Institutions to the engineering institutions globally. There shall be legislative efforts are underway to establish the systems of ABC.

Impact: ABC shall facilitate the engineering students to have ultimate 'Flexibility' in pursuing higher education across the engineering institutions, within India and abroad without losing the 'Credits' already gained for the completed portion of the program

4.3 Flexibility in 'Academic Paths':

Flexibility in academic paths as envisaged shall allow the student to pursue UG and PG programs with different flexible academic paths. This flexibility eliminates the prevalent rigid boundaries in higher education and promotes life-long learning. The flexible academic paths also lead to high-quality multidisciplinary education & research. Flexibility not only confines the academic flexibility of entry & exit into the programs but it also includes providing the scope for students to select subjects/disciplines related to the issues of 'Global' importance. There shall be freedom for the engineering institutions to design Master's programs keeping the global requirements of education & research. However, the students who self-modify on one occasion won't self-alter their analyzing on some other occasion, notwithstanding the mentioned benefits (Boekaerts, M. 1997).

Impact: Flexibility in Academic Paths are going to change the engineering education landscape globally resulting in enhanced employability through the Certificates, and Diplomas and Degrees.

4.4 Migration of Engineering Students:

Higher training is an critical a part of every factor of society, it has an significant impact on engineering training too, specially while incorporated with globalization, as there is an impulse towards cooperation, social concord, social concord, transparency, fairness, and the involvement of greater numbers of human beings in better education (Ead, H.A. 2019) According to Tim Mazzarol et al., (2002), the student migrating to other countries can be the Knowledge & Awareness – On the Programs/Courses; Quality – of Education; Personal recommendation – from relative and friend circle living abroad; Reputation of the Institution – Credentials and Testimonials; Affordability – Cost of education, and relevant expenses including travel; Environment – Climate/Friendliness/free from unrest/free from racism, etc.; Geographic proximity – from the home country (Mazzarol, T et al., 1996).

1. Overseas courses/programs better than local
2. Difficulty in gaining entry at home engineering institution
3. Courses/Programs not available at home country
4. Better jobs in western countries
5. Intention to migrate

According to Mazzarol et al., (2002), six factors would determine to influence student selection of a host country for higher education. Which include employability. MEE as envisaged shall endorse the eligibility accordingly facilitating students to migrate seamlessly.

Impact: There shall be significant migration of engineering students in India to the higher education institutions abroad, especially for pursuing master's programs.

4.5 Humanities, Arts & STEM Blend in engineering education:

According to Sharif (R. 2019), creativity and

innovation are essential components of higher education. The policy aims to bring together STEM (Science, Technology, Engineering, and Mathematics) and humanities and arts disciplines in a way that will produce effective educational results. In addition to critical thinking, teamwork, and problem-solving abilities among engineering institution students, this strategy offers originality and innovation in higher engineering education. Globally speaking, this will have an impact on the demand for mastery of curricula across fields, general engagement & enjoyment with learning, and fostering multidisciplinary education. According to the policy, it is intended for higher education institutions to evolve into degree-awarding multidisciplinary institutions through academic partnerships between institutions, the merger of single stream institutions with other multidisciplinary institutions, and the strengthening of HEIs through the addition of new departments or subjects within the existing institution. Through the use of adaptable curriculum designs, it will be possible to combine several academic fields in novel ways. Additionally, there is a chance to provide dual degrees based on the multidisciplinary disciplines and streams. There is a significant need for teacher orientation in multidisciplinary degree programmes that include internships, community service, and skill courses. A strong emphasis must be placed on developing faculty members' abilities to instruct, mentor, and conduct research in multidisciplinary academic programmes. All professions and fields of study, including STEM education, need that teaching and learning be connected to real-world experiences, the community, the workplace, and the environment (UGC-Guidelines – 2022).

Impact: More number of 'multidisciplinary & interdisciplinary' courses and programs offered by Indian engineering education institutions leading to a 'broader' scope in higher studies facilitating problem-solving skills at the global level rather than existing 'narrow' scope.

4.6 Internationalization of Engineering Education:

The initiatives envisaged in the policy help the students in Indian engineering institutions by providing greater mobility to engineering institutions within India and abroad through 'Academic Credit' recognition, transfer and redemption. India shall be promoted as a 'Global Study Destination' by rendering quality higher education at affordable costs. There

shall be an 'International Student Office' (ISO) established in each engineering institution to coordinate the matters related to the International students. High-performing Indian engineering institutions shall be permitted to establish branches / institutions abroad with mutual agreements, and reputed foreign engineering institution s/Universities shall be allowed to establish campuses in India. It is under the 'processing' to float a 'legislative' framework in this regard with required dispensation regarding regulatory, governance, and other norms. In addition, there shall be research collaborations, student & faculty exchanges between Indian and global institutions. In the policy framework, credits acquired in foreign universities shall be permitted to benefit the international students. Whether at home or abroad, the present-day context of student learning is largely manifested with individual learning supported by the teachers. To achieve individual learning, the environments should be adaptive to the learners' needs. Besides making learners to become domain competent, teachers should encourage them to be self-directed (Jossberger, H., et al., 2010). Internationalization of higher education is expected to provide scope for individual learning by the choice of courses and specializations manifested into a joint program that enables graduates to operate in an international context with global skillsets. Introduction of MOOCs elaborated the space in the education landscape for blended and hybrid design of courses (Smith, B. E., et al., 2013). MOOCs are playing a vital role in Internationalization of higher education. Joint programs intended to benefit the higher education internationalization pave the way for blended and hybrid course designs.

Impact: There will be more 'Joint Programs' by engineering institutions that provide exciting international and comparative higher education opportunities resulting in global 'skillsets'

4.7 Employability

The transition from engineering higher education to the labor market is an important for young graduates. According to (Grosemans, I., et al., 2017), matching educational background with that of working environment is very important. MEE as envisaged shall promote 'employability' at different stages of engineering education programs by awarding certificates, diplomas, and degrees appropriately. Since the NEP-2020 policy envisages the 'employability' to all undergraduate and

postgraduate students with required skillsets. Training, and skill development efforts are strengthened to make every graduate, and postgraduate from Indian engineering institution globally employable. The major objective of engineering education is to produce graduates and post-graduates with employability (Akan Akanksha Mishra et al, 2019)

Impact: All Engineering education institutions India shall adopt the 'Global employability' framework that promises a 'skilled global workforce' with strong communication skills, teamwork abilities, global problem-solving aptitudes, and professional work ethics.

4.8 Research on Higher Education:

Research is an important outcomes expected from higher education system. National education policy envisions on research provide clear demarcation on the research efforts and outcomes by engineering institutions in India. It is observed that the research including research on 'higher education practices' itself is the key focus for the engineering institution s. Globalization and internationalization of higher education became significant in contemporary writing, and are being extensively used in higher engineering education framework (Tight, M. 2021). The research in higher education, especially in engineering education, need to be given priority as this may play a vital role in global transformation in the context of economy and culture symbiosis Marginson, S., 2010).

Impact: There shall be extensive research in the area of 'Higher Engineering Education' system, practices, policy revamps, etc.

5. MEE – The other side of the coin:

The impacts discussed in the previous sections invariably demonstrate the positive side of the MEE implementation in higher education in India, on the contrary, there shall be a few negative impacts, and are enumerated and presented in this section.

5.1 Discontinuity in Engineering Education resulting in poor quality engineers: As the MEE system allows the student to exit at any time of the program, there may be a discontinuity in learning. Engineering education involves many subjects and concepts as pre-requisite for further study. The exit of the student

from the program hampers this resulting in discontinuity and ultimately resulting in poor quality engineers.

Impact: There will be hollow progress in learning hampering the production of quality engineers.

5.2 Victimization of the students: Even when there is a scope for the student to exit the program, there shall be chances that the students may forcefully be sent-out for various reasons.

Impact: Students shall be victimized deliberately forcing them to exit.

5.3 Differed Academic Standards: Since MEE allow the student to exit and re-enter the program at their convenient time later, there may be conflicting aspects of academics if the student wishes to join a different institution.

Impact: Differed academic standards of institutions lead to disparities in student learning.

5.4 Maintenance of ABC: There shall be a huge techno-infrastructure requirements to maintain the ABC database. There shall be an enormous consensus to maintain the same among the qualifying institutions to maintain ABC.

Impact: Difficult to manage ABC and to make the ABC system tamper proof.

5.5 Increased migration of students to renowned or premier institutions: Since MEE allow student migration to other institution during the course of study, there shall be huge migration and induced demand for seats in renowned or premier institutions. This may not be the case with institutions in India, but migration to institutions abroad too.

Impact: Increase of migration of students from local institutions to national/international institutions of repute.

Conclusions:

This article provided the theoretical perspectives related to impact of multiple entry & exit (MEE) on future engineering education in India. The MEE shall have multiple advantages benefiting the students and emphasizes 'flexible academic' choices in engineering

education. The NEP-2020 is a promising policy revamp driving Indian engineering institutions towards a 'knowledge economy' with and ability to create and disseminate knowledge for economic growth, and improve the standard of living. The MEE directly contributes to the 'Access', one of the four pillars on which NEP-2020 was constructed. The MEE shall have multiple influences on higher education with the help of Academic Credit Bank on the way to empower Indian engineering institutions with enhanced enrollment and autonomy; provision of inclusion of more foreign students into Indian institutions; enhance the quality of undergraduate students progressing to postgraduate studies & research to global engineering institutions; promote quality in undergraduate programs that cater to the needs of local and global requirements of quality 'global workforce' with global skillsets; attracting foreign students into Indian engineering institutions for UG, PG, and Doctoral programs, etc. The MEE is a promising opportunity to the Indian engineering institutions in retaining quality graduates who wish to migrate to foreign destinations for post-graduation. GER in engineering education, on the other hand, shall improve progressively due to the implementation of MEE. MEE-ABC blend, once established, shall have a great influence on enhancing Indian engineering institution competencies to set up campuses in other countries with mutual agreements. Since the impacts enumerated in the article are the anticipated outcomes of MEE implementation, the same may be validated with a suitable methodology. In addition to this, the future scope of the present work is to provide a real case studies progressively as the policy implementation continues in the years to come.

Funding:

The Author (s) received no financial support for the research, authorship, and/or publication of this article.

Availability of Data & Materials:

Not applicable to this article as no new data were created or analyzed in this study.

References:

- [1] Akan Akanksha Mishra, Ms. Pragati Sethi, Industry Relevant Curriculum Design in Engineering in India: A Case Study. Journal of Engineering Education Transformations , Volume 33 , No. 2, October 2019, ISSN 2349-

2473, e-ISSN 2394-(2019).

[2] Boekaerts, M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students. *Learning and Instruction*, 7(2), 161–186. doi: 10.1016/s0959-4752(96)00015-1

[3] Damodaram, A. K., Tulasi, L., & Reddy, V. (2021). Covid-19 Situations - Role of Educators in Understanding and Sustenance of Teaching-Learning Practices. *Industrial Engineering Journal*, 12, 37–41.

[4] Dodds, A. (2008). How does globalisation interact with higher education? The continuing lack of consensus. *Comparative Education*, 44 (4), 505 – 517. doi:10.1080/03050060802481538

[5] Ead, H. A. (2019). Globalization in higher education in Egypt in a historical context. *Research in Globalization*, 1(100003), 100003. doi:10.1016/j.resglo.2019.100003

[6] Goodman, Roger, Takehiko Kariya, and John Taylor. Role of the State and the Future of Higher Education in the UK, Japan and Continental Europe (Workshop) (2011 : Oxford. (2012). Higher education and the state: Changing relationships in Europe and East Asia

[7] Grosemans, I., Coertjens, L., & Kyndt, E. (2017). Exploring learning and fit in the transition from higher education to the labour market: A systematic review. *Educational Research Review*, 21, 67 – 84. doi:10.1016/j.edurev.2017.03.001

[8] N E P - 2 0 2 0 D o c u m e n t . (n . d .) . Https://Www.Education.Gov.in/Sites/Upload_files/Mhrd/Files/NEP_Final_English_0.Pdf. Retrieved December 25, 2021, from https://www.education.gov.in/sites/upload_file/s/mhrd/files/NEP_Final_English_0.pdf

[9] M E A A n n u a l R e p o r t . (n . d .) . Http://Www.Mea.Gov.in/Uploads/Publication Docs/33569_MEA_annual_Report.Pdf. Retrieved December 21, 2021, from http://www.meaindia.gov.in/Uploads/PublicationDocs/33569_MEA_annual_Report.pdf

[10] N E P . (2 0 2 0) . http://Www.Niepa.Ac.in/Download/NEP%2020%20Implementation%20Strategy_W.Pdf. Retrieved December 21, 2021, from http://www.niepa.ac.in/download/NEP%2020%20Implementation%20Strategy_W.pdf. Implementation Strategies, published by the Registrar, National Institute of Educational Planning & Administration, New Delhi, India, 2020. (n.d.).

[11] Jossberger, H., Brand-Gruwel, S., Boshuizen, H., & van de Wiel, M. (2010). The challenge of self-directed and self-regulated learning in vocational education: a theoretical analysis and synthesis of requirements. *Journal of Vocational Education and Training*, 62(4), 415–440. doi:10.1080/13636820.2010.523479

[12] Krajewska, A. (2020), & University of Białystok, Faculty of Education. (2020). Globalization and higher education: The Polish perspective. *Eastern European Journal of Transnational Relations*, 4(1), 15–31. doi:10.15290/eejtr.2020.04.01.01

[13] Lane, J. E. (2011). Importing private higher education: International branch campuses. *Journal of Comparative Policy Analysis: Research and Practice*, 13(4), 367–381. doi:10.1080/13876988.2011.583106

[14] Marginson, S. (2010). Higher education in the global knowledge economy. *Procedia, Social and Behavioral Sciences*, 2(5), 6962–6980. doi:10.1016/j.sbspro.2010.05.049

[15] Mazzarol, T., Kemp, S., Savery, L., Australian International Education Foundation, & Curtin University of Technology. Curtin Business School. Institute for Research into International Competitiveness. (1996). International students who choose not to study in Australia : an examination of Taiwan and Indonesia. Canberra, Australia: AEIF Policy Research and Analysis Section.

[16] Mazzarol, Tim, & Soutar, G. N. (2002). “Push-pull” factors influencing international student destination choice. *International Journal of Educational Management*, 16(2), 82–90. doi:10.1108/09513540210418403

[17] Naik, Naik, B. M. (2020). Role of Indian universities and colleges vital in employment generation can they afford to ignore? At what cost? Who pays? Nations which lead in innovation take away jobs from those who lag. *Journal of Engineering Education Transformations*, 33(4), 45–49. doi:10.16920/jeet/2020/v33i4/153160

[18] Perez-Encinas, A., Rodriguez-Pomeda, J., & de Wit, H. (2021). Factors influencing student mobility: a comparative European study. *Studies in Higher Education*, 46(12), 2528 – 2541. doi:10.1080/03075079.2020.1725873

[19] Sharif, R. (2019). The relations between acculturation and creativity and innovation in higher education: A systematic literature review. *Educational Research Review*, 28(100287), 100287. doi:10.1016/j.edurev.2019.100287

[20] Smith, B. E., Derek, O., Douglas, H., & Fisher, K. E. (2013). Wrapping a MOOC: Student perceptions of an experiment in Blended Learning. *MERLOT Journal of Online Learning and Teaching*, 9(2), 187–199.

[21] Teichler, U. (2015). Higher education research. In International Encyclopedia of the Social & Behavioral Sciences (pp. 862–869). Elsevier.

[22] Tight, M. (2021). Globalization and internationalization as frameworks for higher education research. *Research Papers in Education*, 36(1), 52–74. doi:10.1080/02671522.2019.1633560

[23] UGC-Guidelines – 2022- Transforming Higher Education Institutions in to Multidisciplinary Institutions - https://www.ugc.gov.in/pdfnews/5599305_Guidelines-for-Transforming-Higher-Education-Institutions-into-Multidisciplinary-Institutions.pdf

[24] (2021). National Education Policy (NEP) 2020 and SCSVMV. *CSIT* 9, 11-15 (2021).

[25] V., Kannan. (2021). National Education Policy (NEP) 2020 and SCSVMV. *CSIT* 9, 11-15 (2021).

[26] Volet, S. (1999). Learning across cultures: appropriateness of knowledge transfer. *International Journal of Educational Research*, 31(7), 625–643. doi: 10.1016/s0883-0355(99)00028-2