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AN ANALYTICAL STUDY OF HOW TO BRIDGE THE GAP BETWEEN INDUSTRIAL REQUIREMENTS & ACADEMIC CURRICULUM

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ABSTRACT

Currently, construction education often focuses on traditional skills, such as scheduling and cost estimating. This creates a mismatch between industry requirements and the student's academic curriculum.. As the technologies are changing rapidly the gap has been increasing. To bridge the gap between industry requirements and academic programs, there is a need for industry directed curriculum, design enabling graduates to quickly transition into positions in industry requirements.

This paper tries to find the gap between academia and industry & present a process for developing a curriculum that considers industry needs and expectations. It has been found that the irregularity in curriculum up-gradation played a role to increase the gap, so continuous up-gradation is very much essential in the academic framework.

Keywords: Research conclave, Industry directed curriculum, Curriculum enrichment, sabbaticals, hybrid learning mode, networking forum.

INTRODUCTION

In each year India produce massive number of graduates and post graduates in the world. Also, graduate colleges in the country growing in good percentage per year. As per India today (9th September 2021) reported, India has over 45,000 degree colleges, over 1000 universities and around 1500 top institutes. The paradox is that, despite the increase the number of colleges or universities, the competition for acquiring fresh talent every year is so heated that it gives an impression that resources are really scarce. The challenge is not the supply of talent but that of talent that meets the needs of corporate world. It is found that if students elongate their skills in specific areas desired by the industry, then employability in the country can be significantly enhanced.

With the development of different educational theories and approaches, the methods of the teacher in the formal education system also changed to fulfil the need of current classroom requirement. In the formal education system at college, the responsibility of professors became more innovative to facilitate the learner to accommodate skill development, lateral thinking, and creativity.

The massive demand for complementary training of graduates in India indicates a mismatch between academic education and industrial requirements. This process is time consuming and expensive, as many decentralized practice-oriented educational infrastructures must to keep up to date and operated by the industry. To bridge this gap it would be expected that learning factory should have Industry directed curriculum that always ready to rhythm with industry requirements.

REVIEW OF LITERATURE

1. **MISB Bocconi/ nucif.net/**: With growing economy, India is also witnessing the growth of education sector. However, Indian industry is not so convinced about the job-readiness of the graduates. There is an urgent need that Indian Industries and Academia come together and address some of the underlying challenges. However, the rapid pace of change in the outside environment is compelling these two different worlds (Academia and Industry) to come together to address and solve some of the real world challenges.

2. **Participation of Industry in Curriculum Design and Delivery, Dr. Balasubramani R., Professor & HOD. of ISE, NMAMIT/:** The paper entitled: After tied-up with Industries and Academia – Industry interaction, It has been mutually rewarding to both the institutions and interacting industries, with significant improvements in curriculum, training inputs, project work, R & D outputs, publications/ patents and placements, to both students and faculty. Overall there has been increase in intellectual outputs, which will contribute to the overall growth and development of the institutions as well as nation.

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With the development of different educational theories and approaches, the methods of the teacher in the formal education system also changed to fulfil the need of current classroom requirement. In the formal education system at college, the responsibility of professors became more innovative to facilitate the learner to accommodate skill development, lateral thinking, and creativity.

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3. **Bridging the gap between academia and industry in India, Lennart Buth, Vikrant Bhakar, Nitesh Sihag, 7th Conference on Learning Factories, CLF 2017, ELSEVIER:/** India has taken most of its growth rate in gross domestic product (GDP) from the service sector in the past ten years. The sector of manufacturing is yet to become a relevant contributor to the total GDP. The Indian government has started an ambitious plan named "Make in India". The objective of this plan is to make India a global hub for design and manufacturing. The All India Council for Technical Education (AICTE) statistics show that the enrolment of youth for technical courses in India is lower than the available capacity and less than 40% of the graduating students get job in industry. This clearly shows a mismatch between the industry requirements and academic skill development.

AIM OF THE STUDY

The aim is to understand the gap between Industry requirements and curriculum design by facilitators and to understand how any college/ institute or a facilitator can create a bridge to fulfil the gaps.

OBJECTIVE OF THE STUDY

1. To find the gap between Industry Requirements and Curriculum design.
2. To understand the role of a facilitator (Principal/ HOD/ Coordinator/ Faculty) to frame a curriculum to reduce the gap between academics and industry requirements.
3. To decode the industry's' basic requirements.
4. To find the solution for Industry directed curriculum.

METHODOLOGY

1. The primary data are collected by taking a survey having small sample size. Chi-square test & ANOVA test are used for data interpretation.
2. The secondary data are presented in this paper are collected from various government and non-government agencies websites'. Information is collected from various authenticated websites.

HYPOTHESIS OF THE STUDY

1. There is no gap between Industry requirement and Curriculum design.
2. Hybrid learning methodology will not be helpful to reduce the gap between academia and industry.
3. Industrial exposure does not help Faculty and students to grow potentially in their career.

DATA ANALYSIS AND INTERPRETATION

TEST 01)

H0: There is no gap between Industry requirement and curriculum design.

H1: There is gap between Industry requirement and curriculum design.

Sample Size: 31 (No. of respondents)

Level of significance: 0.05

Actual Data

	Significantly different	Significantly no different	Total
Industry requirements and Curriculum design	27	4	31

Expected Data

	Significantly different	Significantly no different	Total
Industry requirements and Curriculum design	15.5	15.5	31

Using Chi-square test

	Level of Sign.	Df	Value	p-value
Chi-square test	0.05	1	3.84	0.000036131

Conclusion:

Since, p-value is less then level of significance.

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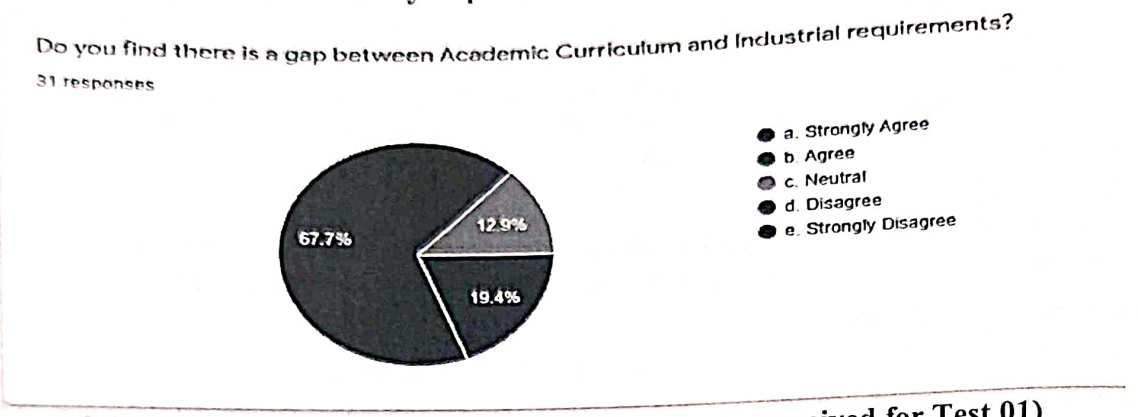
Therefore, Null Hypothesis falls under critical region

Hence, Null Hypothesis is rejected.

Therefore, there is a gap between Industry requirements and curriculum design.



(Figure 01: Graphical presentation of all responses received for Test 01)

TEST 02)

H0: Hybrid learning methodology is not helpful to reduce the gap between academia and industry.

H1: Hybrid learning methodology is helpful to reduce the gap between academia and industry.

Sample size: 31 (No. of respondents)

Level of significance: 0.05

Actual Data

	Favoured	Not Favoured	Total
Hybrid Learning	22	9	31

Expected Data

	Favoured	Not Favoured	Total
Hybrid Learning	15.5	15.5	31

Chi-square test

	Level of Sign.	df	Value	p-value
Chi-square test	0.05	1	3.84	0.019550269

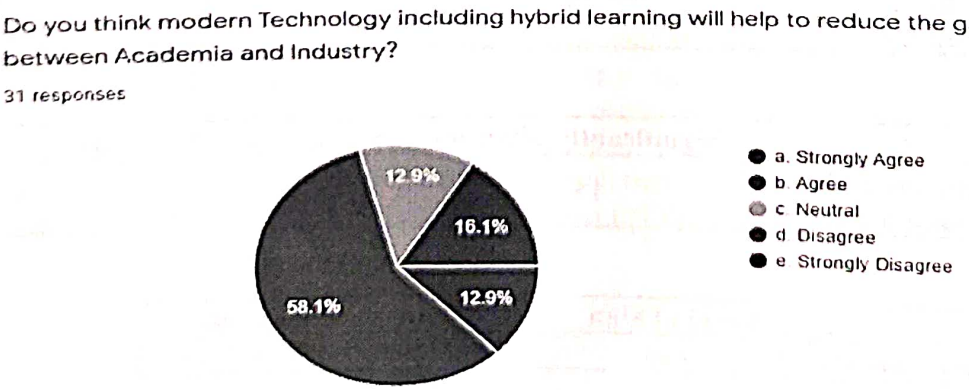
Conclusion:

Since, p-value is less then level of significance.

Therefore, Null Hypothesis falls under critical region

Hence, Null Hypothesis is rejected.

Therefore, Hybrid learning methodology is helpful to reduce the gap between academia and industry.



(Figure 02: Graphical presentation of all responses received for Test 02)

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TEST 03)

H0: Industrial exposure does not help faculty and students to grow potentially in their career.

H1: Industrial exposure does help faculty and students to grow potentially in their career.

Sample Size: 31 (No. of respondents)

Level of significance: 0.05

Actual Data

Industrial Exposure	Yes	No	Total
Industry Experience for faculty	24	7	31
Short Industrial Projects	27	4	31
Workplace Exposure for students (live Projects; Internships)	27	4	31
Faculty Exchange Program with Industry (Campus Connect Faculty Partnership model)	29	2	31
Total	**107**	**17**	**124**

Using ANOVA Test:

ANOVA: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Yes	4	107	26.75	4.25
No	4	17	4.25	4.25

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1012.5	1	1012.5	238.2353	4.6765E-06	5.987378
Within Groups	25.5	6	4.25			
Total	1038	7				

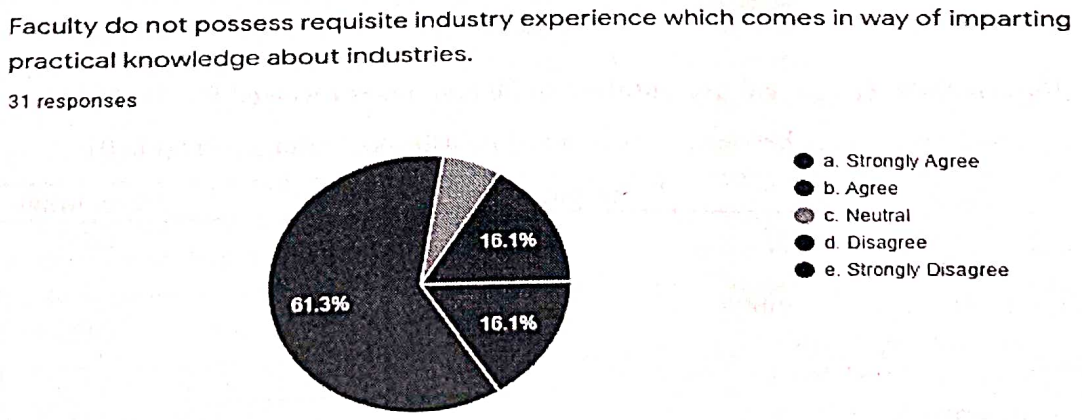
Conclusion:

Since, p-value is less then level of significance.

Therefore, Null Hypothesis falls under critical region

Hence, Null Hypothesis is rejected.

Therefore, Industrial exposure does help faculty and students to grow potentially in their career.



(Figure 03-A: Graphical presentation of all responses received for Test 03)

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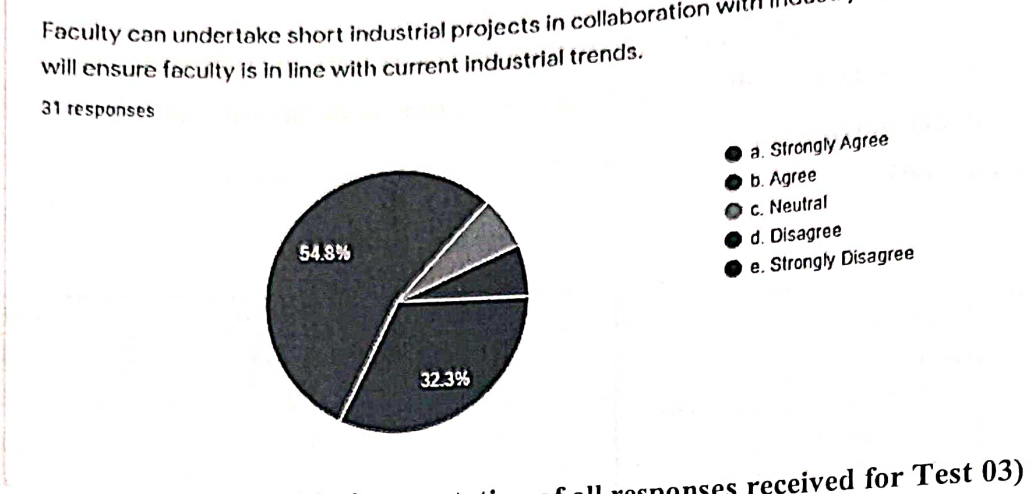
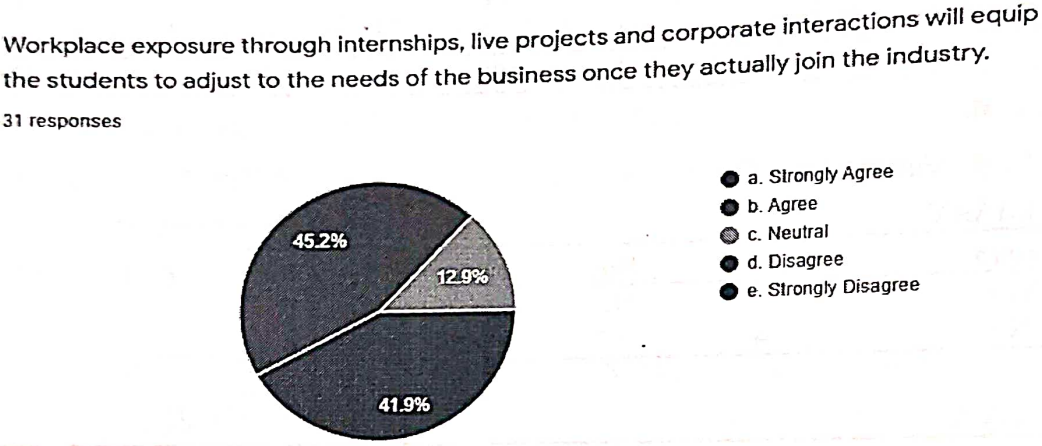
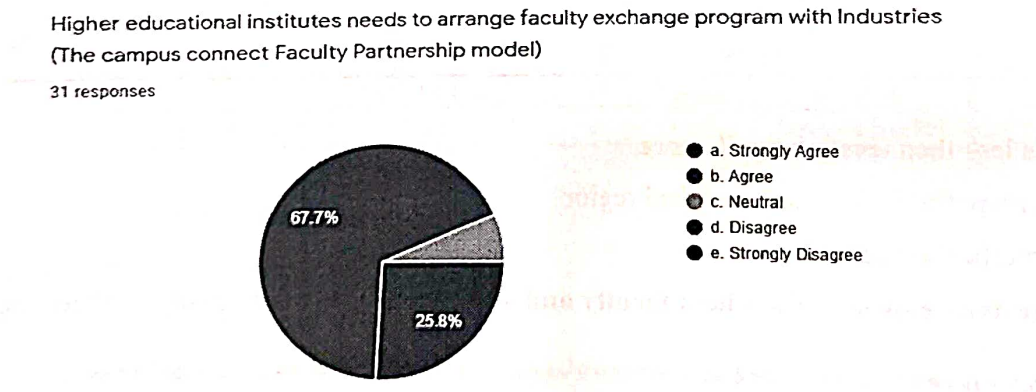


(Figure 03-B: Graphical presentation of all responses received for Test 03)



(Figure 03-C: Graphical presentation of all responses received for Test 03)



(Figure 03-D: Graphical presentation of all responses received for Test 03)

The possible ways to make the bridge between academia and industry are outlined, in table 01.

No.	Possible Ways	Respondents in favoured	Percentage
1	Workshops for students	21	68%
2	Seminars	12	39%
3	On-line faculty Community/ Networking Forum	8	26%
4	Curriculum enrichment	14	45%
5	Research Conclaves	14	45%
6	Industrial visits	20	65%
7	Sabbaticals	15	48%

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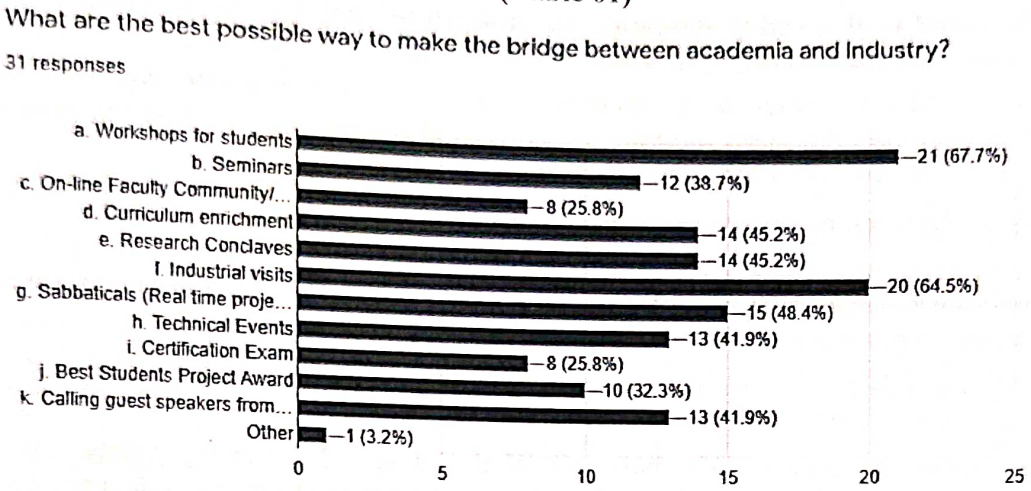
8	Technical events	13	42%
9	Certification Exam	8	26%
10	Best students project award	10	32%
11	Guest speaker from industries	13	42%
	Total Responses	**31**	**100%**

(Table 01)



(Figure 04)

Fig. 04: The possible ways to make the bridge between academia and industry.

SIGNIFICANCE OF RESEARCH:

The study found that, there is gap between industry requirements and academic curriculum. Because faculty do not possess requisite industry experience, they found difficulties in sharing practical knowledge with students. Industrial exposure i.e. real time project work, internship, industrial visits, corporate interactions and sabbaticals will definitely help students to build their career potentially, in which hybrid mode of learning can also play an important role. 80% of the respondents agree that the curriculum should revise regularly and is developed in accordance with industry needs. More than 80% respondents agree that 'Academia' regularly looks at existing pedagogies and see if the same can be improved and made more practical approach. If the learning factory collaborates with industry experts for short industrial projects then it will be beneficial to both the parties' i.e. there is a need for strong partnerships between academic institutions and the industries.

The following possible ways helps to bridge the gap between academia and industry (Table 01/ Fig. 04) : workshops, seminars, networking forum, curriculum enrichment, research conclaves, industrial visits, sabbaticals, technical events, certification exams, students projects awards, guest speaker from industries.

DISCUSSION

The study of NSF (National Science Foundation) identified certain critical skills that are required in employee to stand potentially in industry filed, & they are (1) Ethics and professionalism, (2) Problem solving skills, (3) Written and oral communication, (4) Customer support, (5) Teamwork and conflict resolution skills, (6) Creativity and innovation, (7) Ability to set priorities and innovation, (8) Project management. The Advisory committee or college development committee should make efforts in order to identify how these critical skills can be better integrated into a higher education curriculum & then subsequently accessed.

Curricula are maintained and improved through a variety of activities. While framing academic accreditation criteria using: Vision & Mission, Program Educational Objectives, Program Outcomes, Course Outcomes, Assessment, Evaluation, Mapping & Rubrics, the Advisory committee & College development committee ensures that these outlines to be designed by keeping in mind that the students gain all necessary skills (Industrial skills) in his/ her academic career. The skilled based curriculum must include: (1) Interpersonal skills, (2) Leadership capability, (3) Communication skills, (4) Creative thinking, (5) Higher level problem solving skill, (6) Decision making etc.

WIP (Work Integrated Learning) model can be beneficial to reduce the gap. Currently, in IT sector organizations like Samsung, Wipro, Infosys, IBM and Oracle are embracing WIL programs. Under the WIL program, college tries to tie-up with these company & design industry directed curriculum accordingly.

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STRATEGIES

1. To get an in-depth understanding of the institutional perspective, the meeting should be conducted by the higher authorities/ curriculum designers of the Institute/university.
2. The curriculum development process is reviewed and monitored by a curriculum development committee for the whole university as well as affiliated colleges.
3. Industry representatives need to participate in Board of Studies meeting conducted by academic institutions. They need to thoroughly scrutinize the professional courses and give suggestions wherever required to meet the **current industry requirements.**
4. Well known and popular industries design their own course as per their needs. Academic institutes can offer them as elective in the final year semester students. Students who opt for those elective will undergo **training and qualify the examination.**
5. As the electives are designed by industry experts, the academic faculty should be trained to effectively train the students.
6. Industries in association with academic institutions need to conduct **Research conclave.** In this conclave students are required to present their research in form of ideas, proposals and products.
7. Every university has a large number of alumni. We can draw these members (those are working in industry) to be involved in curriculum design.
8. To deliver the third-year students, we shall call Work Integrated Learning program which enables undergraduate students to be placed in industry for 6-8 weeks to undertake industry-focused projects.
9. Every institutes may organize **inter or intra college research conclave**, where best ideas, proposal should be **awarded** either by monetary value or industrial exposures.
10. Work Integrated Learning program should be implemented in each and every year of degree students.
11. **MOOCs (Massive Open Online Course)** can play an important role for building soft-skills among youth. Academic institute may ask students to complete two to three certification courses through MOOCs (https://swayam.gov.in/) to make them ready for career perspective.

CONCLUSION

1. In the final year semester, the elective subjects should be based on current industry requirements & that subject should be run by industrial experts only.
2. Set the curriculum with the right latest technology and to be updated regularly.
3. Industries conduct workshops for students in emerging area of technology. Industries directly address the students and train them in the best practices followed in industries.
4. Educational institutes required to run soft-skills training program for all level undergraduate students.
5. Guest lectures of industrial experts need to arrange in professional courses.
6. Fast changing technology demands new skilled people in market, so to meet the requirements curriculum should be revised regularly and this cycle continues.
7. Institutes need to sign MOU (Memorandum of understanding) with industries to build industry directed curriculum and to provide industrial exposure to students.

REFERENCES

1. https://www.indiatoday.in/education-today/news/story/nirf-ranking-2021-full-list-check-top-20-institutes-in-india-top-3-from-every-category, Retrieve date: 2nd January 2022, Sunday, 10:30 a.m.
2. https://nucif.net/wp-content/uploads/2019/12/How-to-bridge-the-gap-between-academia-and-industry-EN.pdf, Retrieve date: 5th January 2022, Wednesday, 11:00 a.m.
3. **Title**: Bridging the gap between academia and industry in India, **Author**: Lennart Buth, Vikrant Bhakar, Nitesh Sihag, Christoph Hermann, 7th Conference on Learning Factories, CLF 2017, ELSEVIER, Page No. 275-282.
4. **Title**: Participation of Industry in curriculum design and delivery, Author: Dr Balasubramani R, professor & HOD of ISE, NMAMIT, Nitte.
5. https://swayam.gov.in/, Retrieve date: 5th January 2022, Wednesday, 12:00 p.m.