Indian Journal of Information Sources and Services
ISSN: 2231-6094 (P) Vol.15, No.1, 2025, pp.74-82

DOI: https://doi.org/10.51983/ijiss-2025.IJISS.15.1.12

Navigating Challenges in Engineering Education: A Comprehensive Examination of Kerala's Landscape and Policy Interventions

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(Received 15 November 2024; Revised 30 December 2024, Accepted 18 January 2025; Available online 28 March 2025)

Abstract **- This study explores the crucial link between engineering education and industry collaboration in Kerala, focusing on the disparity in industry-institute interactions across the North, Central, and South regions and their impact on employability and educational quality, especially in mechanical and electrical engineering fields. Industry-institute interaction is vital for the practical application of engineering education. Despite high-quality educational institutions, many students struggle to secure desirable jobs or salaries due to limited industrial establishments and high competition for placements. Kerala Technological University (KTU) aims to bridge this gap by connecting engineering colleges with industries through various programs. The research divides Kerala into regions and classifies educational institutions as urban or rural, using a comprehensive questionnaire to capture insights from students, teachers, placement officers, and industry recruiters. The study identifies the challenges faced by institutions with weak industry connections and suggests measures to enhance these interactions. Findings indicate that industry-institute interaction significantly enhances the quality of engineering education, highlighting the need for better alignment between academic curricula and industry needs, modernization of teaching methods, and improved infrastructure. The research underscores the importance of strengthening industry-institute interactions to improve employability and educational standards in Kerala. Successful examples of such collaborations highlight the potential benefits, calling for a concerted effort from educational institutions, industries, and the government to bridge existing gaps. Enhanced industry collaboration is essential for the future sustainability and competitiveness of engineering education in Kerala.**

Keywords**: Industry Collaboration, Skill Development, Employability, Career Counselling, Teacher Training**

I. INTRODUCTION

Engineering education has yielded enormous benefits in the fields of higher education. An attempt is made here to determine the regions in which engineering colleges are located in Kerala and accordingly, whether they face any disparity in terms of industry-institute interaction.

The research was done on the basis of dividing Kerala into three parts namely South, Central and North. In general, there are more educational institutions in the said South, Central and North regions. It has been tried to understand its causes and how educational institutes in rural areas and urban areas and educational institutes belonging to the category of tier one tier tour affects things like industry-institute interaction.

Similarly, a questionnaire was designed to provide a comprehensive understanding of the factors influencing career development in college students. Based on that, an inquiry was made in the colleges and industry and the questionnaire was prepared by including the students, teachers and placement officers of the college and the recruitment officers of the companies. Based on that, it was possible to understand the extent of its impact on students, especially in areas such as placement, or some professional institutions that do not have it completely are lagging behind in every sense when comparing their education quality with other institutions, i.e. with institutions that maintain it very precisely.

We have tried to understand the things needed to raise it and how it can be raised. Many factors are affecting its quality, such as the relaxation of the eligibility criteria for the entrance exam and problems arising in the admission process due to the large number of colleges. Here we discuss in great detail the lack of quality of education and employment opportunities for engineering students and why. Here, students need to understand what they can do with an engineering degree, and what institutions might be able to advance when compared to institutions that are already doing

it or are not doing it as successfully. It mainly deals with the current affairs of engineering education in Kerala.

II. Background of the Study

Engineering education is very important for the advanced research sector in Kerala. So, as much as it is possible to raise the standard of engineering education, there is a great need to raise it. So, in such a situation, when engineering students study a course related to it, their expectations should rise accordingly (Ghanadinezhad & Ghane, 2024). The study is important to understand what are the current problems in the field of education. As part of that, the relevance of things like industry-institute interaction is discussed. For that, with the help of questionnaires, it is possible to conduct a survey in educational institutions and industrial institutions and understand the extent of the gap between them using the data obtained.

III. Statement of Problem

The time has come to change the educational methods in the field of professional education, especially in the field of engineering. Things like Industry Institute Induction are something that elevates educational institutions to the forefront. The quality of engineering education in Kerala is full of challenges and there are many reasons behind it. The aim of this study is the same. Over the past few years, engineering education has been on the path of awakening in all its aspects. But this should have been done much earlier. But it is necessary to make the changes going on now to a higher standard. Only by achieving more goals can engineering education reach the high standards we desire. Communication is even more critical as the engineering education sector has always been with industries (Kumar et al., 2013). There is no doubt that the importance of industry-institute interaction is very high in Kerala, where employment opportunities in general are very few in some sectors. These are the reasons why students in Kerala are lagging behind in recruitment especially from the core sectors or the recruitment from some core sectors is decreasing. It is very important to improve the engineering education sector as it is of great importance both socially and economically. Similarly, the need to move from the era of traditional engineering jobs to modern courses is very important and it is very important to understand the need and move forward with it.

IV. Review of Literature

This section establishes the context and identifies gaps that the current study aims to address. This section reviews existing literature on engineering education in Kerala, discussing the concerns surrounding educational quality, eligibility criteria, and the role of KTU. It establishes the knowledge gap that the current study aims to address.

4.1. Role of Industry Institute Interaction in Making of Entrepreneurs

In this article, the authors give an insight into how open peer review benefits scholarly publishing by enhancing transparency and collaborative validation in academic research. It also elaborates on how industry-institute collaborations are taking place in higher education and to what extent they can fill the gap, drive innovation & enhance employability. This discussion paper outlines the constraints of energy efficiency and environment conservation associated with capacity expansion in the Indian cement industry and zeroes on addressing such concerns by modernisation process coupled with spiffing up training mechanism to overcome address the issue (Khodjaev et al., 2024). It further highlights the key elements that enhance success in any joint training program for auto ancillary component manufacturing by providing contemporary tools and exposure of modern-day practices as features to an effective facilitation through this initiative. In closing, the article recommends more industrial experience for educational leaders and short courses in industries to faculty members as well as strengthened academia-industry collaboration towards common business goals; thereby increasing mutual benefits from businesses (Kavitha & Balasubramanian, 2022).

4.2. Assessing the Relevance of an Indian Undergraduate Civil Engineering Programme: A Fuzzy Analytical Hierarchy Process Approach

An Indian undergraduate civil engineering program is assessed for its relevance by the fuzzy analytical hierarchy process, concentrating on primary course groups necessary to prepare students working within the building construction sector (Karimov et al., 2024). It is a clear indicator of the depths that one has to attain as far as course context and keeping industry needs in design are concerned, which will automatically uplift job prospects and employability thus enhancing the bond between academia and industry. Results indicate possible curriculum modifications that could improve construction student employability. In addition, the study identifies real factors that obstacle skilled labour in sustainable construction from practitioners' perspective of Makkah. In conclusion, the paper contributes to debates about curriculum evaluation and academic-industry partnership in order to further promote employability within civil engineering education (Padhi, 2024).

4.3. Enhancing Innovations, Research, and Development in Indian Higher Education Institutes

The paper Deep Dive: Exposing Indian Engineering Institutions to Research and Innovation Issues, discusses the problems faced by engineering educational institutions in India as they try to push research and innovation forward; which include a lack of investments, nascent research systems or complications ranging from administrative. It calls for a cultural change in research priorities. The K J Somaiya Institute of Engineering and Information

Technology (KJSIEIT) research, development and innovation in practice using the characteristics showcased by incubator support, industry connect as well government funding will be a prime example to elaborate on. Top of page the research highlights the importance of interdisciplinary partnerships, greater enrolment in a PhD program and clear structures to enhance ecology development while promoting ecological engagement among least-developed nations. On the whole, we get to learn some invaluable lessons and implement measures on how Indian engineering institutions can improve their research quotient which will help them survive better in this dog-eat-dog world (Padma & Sridhar, 2015).

4.4. Enhancing Placements in Educational Institutes: A Novel Approach

The article discusses ABC analysis in educational institutes for better placements by classifying visiting companies into A, B and C categories on the basis of their value contributions. Crafted to facilitate better interactions with industry experts and increase opportunities for placements. Emphasises the need for employing ABC analysis, a methodology familiar to inventory control management, albeit in an unusual territory and by improving industry-institutes relationships and ensuring better student placements. This research highlights the various benefits of the 'A' category corporate interface like scholarships, internships and augmented industry collaboration will altogether lead to the growth and development of such institutes. Summing it up, the article shows a strategy to drive leverage in placements along with building partnerships, and thereby enriching both; this is something institutions would learn on a pilot basis if looking at ways for better outcomes from their placement (Patel et al., 2024).

4.5. Impact of Industry Institute Interaction in Engineering Education to Enhance Employability

India has a long way to go in terms of improving student employability through greater industry integration senses, what with most engineering institutes for one? It brings out the much-needed aspects like industry-institute interface and new teaching methodologies, offering students an experience in an actual working atmosphere and has been recognized for enhancing technical education standards. The study presents a case from MMMP where an add-on course in Automobile Engineering Diploma was introduced to bridge the gap of requirements between industry and academia that impacts skill development, employment etc. The article does a great job of providing perspective on the way that schools really improve their industry partnerships, better provide roles to students within those relationships and are relevant in an experiential environment (Gadekar et al., 2024).

4.6. Nonlinear Pathways into Mechanical Engineering

Taking us on a personal journey, a working female mechanical engineer describes the non-linear path she trod to land in her current position. They reinforce the need to embrace different experiences and also encourage grabbing chances during your pursuits. It is also a story that reveals the challenges of an immigrant life, family pressures and health struggles; Echoing the extraordinary resilience and determination needed to navigate professionally through mechanical engineering as well in a world dominated by men. Together, the article highlights how trigger events and heterogeneous experiences are crucial in influencing career paths providing a richer understanding of what pathways really look like for women pursuing STEM careers (Patil & Ukarande, 2024).

4.7. Migrant Vulnerabilities: 'Guest Workers' in Kerala, India

An article discussing the problems faced by 'Guest Workers' in Kerala, India - specializing in how vulnerable and precarious migrant labourers are within this region. The authors explore the effect of external processes like COVID-19 on these workers, emphasizing that systemic change is required to address urban vulnerabilities and ensuring the safety of vulnerable populations. It also addresses general aspects of international migration. Which highlight global factors that impinge on the organization and flow patterns of guest workers in Kerala This article tells a powerful story, how the harsh life paths of migrant workers and their socio-economic issues that - following from it can be addressed through policy interventions to ensure better protection mechanisms which improve living in dignity (Reeja-Jayan, 2022).

4.8. Crisis Faced by a B-School

The article casts a critical eye on the marketing mistakes of one illustrious B-school and emphasizes what such decisions involving stopping all advertising or taking oneself off B-school surveys can do in terms of plummeting admissions to crisis point (Revana et al., 2014). It stresses the need to reposition strategies for B-school leadership in order to increase its visibility and boost the brand equity of the institution. It provides clues for immediate quick fixes. Such as using digital marketing to create brand awareness among the target population and stressing embracing adaptative strategies in combating issues like poor infrastructure, negligible research output, remaining at the bottom positions in national surveys etc. Together it offers some real-life lessons on how to handle crises and adapting well to the changing nature in environmental requirements for education in relation (Revana et al., 2014).

4.9. India's Labour Market Challenges: Employability of Young Workforce from the Perspective of Supply and Demand

This article will provide an understanding on employability that, as an example of an inescapable concept has two faces and multiple interpretations while being the subject matter to varying definitions depending upon countries or regions. This section pinpoints the main elements of employability in India, like the subject knowledge, soft skills and VET system.

The literature review contributes an understanding of the criticality of technical knowledge, in conjunction with personal competencies and environment when considering bolstering employability, particularly in the Indian context. The article also deals with the theoretical, social practical and political contexts required for effective employability which follows on from earlier discussion in this document of foundational principles.

4.10. Analysing Review Studies and Bibliometrics of University-Industry Interaction Using Scoping Review

This article follows a systematic approach and uses the PRISMA diagram to sample and data selection, thus ensuring a robust process of review It confirms the status of articles as the leading type in studies on university-industry interaction, drawing attention to their mission regarding spreading research findings and development in specific fields. The study is in line with the prevalent research methodology based on qualitative methodologies and systematic review methods applied to text analysis of university-industry interaction current research streams. Furthermore, the article combines literature review type (LR), qualitative content analysis (QCA) and bibliometric via Scopus to come up with a comprehensive view of university-industry collaboration research. The results of this research remind the obvious importance of choosing high-quality data sources and implementing a tough quality control process that all analysed (Saldanha & Aranha, 2024).

4.11. Enhancing Innovations, Research, and Development in Indian Higher Education Institutes

This article provides a deeper insight into the relationship of industry with academia in India and how they are dependent on each other for technological advances and providing solutions to societal problems (Hernández et al., 2024). This clearly points out the importance of academic-industry linkage that helps foster innovation thereby leading to a conducive Eco-system for National Development as well as Economic Growth. This sort of study sheds light on the increasing importance of industry-institute interface in engineering education, by also acknowledging that both sectors have critical roles to play in advancing technological and economic development. Overall, the article highlights that strong collaborations between industry and academia are essential to innovation -and ultimately achieving broader societal and economic impacts (Bhat & Kaur, 2024).

4.12. Model Development for Assessing Inhibitors Impacting Industry 4.0 Implementation in Indian Manufacturing Industries: An Integrated-Fuzzy Micmac Approach

It is a systematic literature review to examine the theoretical viewpoints and facets of Industry 4.0 Adoption in Indian manufacturing industries, by exploring electronic databases as well as specific keywords for searching related research papers from numerous sources. In the past, Multi-Criteria Decision Making (MCDM), surveys and interviews have been extensively used in literature to evaluate factors affecting Industry 4.0 adoption using various statistical tools allowing to offer deeper perspectives into the domain of study. The primary contribution of the study is it identified barriers to Industry 4.0 implementation in India using Principal Component Analysis (PCA), Interpretive Structural Modelling (ISM) and Fuzzy MICMAC techniques, which provided a possible path towards overcoming research challenges effectively. The level of interest in Industry 4.0 from policymakers, manufacturing sectors and academic researchers highlights its significance for business competitiveness and sustainability by manifesting a plethora of opportunities available within the framework that this can present to companies if managed effectively (Schneider & Pilz, 2024).

4.13. Development of the House of Collaborative Partnership to Overcome Supply Chain Disruptions: Evidence from the Textile Industry in India

This article details the creation of the House of Collaborative Partnership (HCP) to resolve supply chain disruptions in the textile industries of India, with trust, collaboration and top management facilitation as building blocks. It emphasizes joint academic and industry interests in supply chain management, innovation, and sustainability. It also talks about how the new normal - like Industry 4.0, principles of circular economy and sustainability are ushering in a paradigm shift in supply chain practices towards advanced technologies as well eco-friendly ones as well. In sum, the current study illuminate's resilience in responding to supply chain disruption through inter-organizational collaboration with practical implications for industry stakeholders and policymakers (Sharma et al., 2024).

4.14. Determinants of Foreign Direct Investment: Employment Status and Potential of Food Processing Industry in India

The analysis deals primarily with the role of labour in investment decisions and, specifically tests how human capital affects Foreign Direct Investment (FDI) globally using an unbalanced panel data set at the country level during 2005 for manufacturing. This revisits Kaldor's technical progress function to emphasize labour dynamics in intermediate goods sectors, underpinning a higher rate of investment (Karimov et al., 2024). The report recommends that they focus on domestic bases in intermediate goods - rather than final consumer products - to incentivize FDI while also providing specialized employment. As a whole, it gives information on how human capital contributes to the FDI-employment interaction in manufacturing and, as such is able to provide evidence-based insights into investment decision factors.

4.15. Technical Efficiency Analysis of Indian IT Industry: A Panel Data Stochastic Frontier Approach

This paper uses Data Envelopment Analysis (DEA) to empirically study efficiency dynamics and sustainability in the Indian IT-ITES industry. It examines how things like

patent laws, product life-cycle length and multinational activity influence the growth and sustainability of industries. Overall, Canback's research underscores the contradiction between India's software success and service industry growth during its development transition. The study also presents an examination of the efficiency and productivity in the Chinese IT industry with a DEA Malmquist index, comparing to firm performance. This paper is a complete examination work about efficiency, sustainability and growth factors existing in India's IT-ITES sector (Cherian & Rajan, 2024).

V. Research Gap

Building on the literature review, this section explicitly identifies the research gap, emphasizing the need for a detailed investigation into the effectiveness of industry-institute interaction in Kerala's engineering education. Building on the literature review, this section explicitly identifies the research gap, emphasizing the need for a comprehensive study on the impact of relaxed eligibility criteria on educational standards and employability in engineering colleges.

VI. Research Methodology

The methodology section delineates the research design, data collection methods, and participants involved in the study. The focal point is a questionnaire-based investigation engaging both students and recruitment professionals, aiming to capture diverse perspectives and insights.

- The research was conducted at prominent engineering colleges in Kerala, employing a comprehensive research design.
- The components of the research design encompassed database design, involving the collection of primary data from engineering students across the south, central, and north regions of Kerala. Additionally, secondary data was sourced from government records, official documents, journals, textbooks, and internet portals.
- Measurement design involved the utilization of questionnaires, employing nominal, ordinal, interval, and ratio scales based on the nature of the data. Statistical tests, including One sample test, independent sample test, and ANOVA, were applied as appropriate.
- The sampling design adopted a simple random sampling method, resulting in a total sample size of 456, with 58 samples each obtained from the student and industry communities of selected engineering colleges in Kerala.
- The study spanned from 2015 to 2020, and statistical analyses were performed using suitable mathematical and statistical tools.

VII. Scope Of The Study

This section delineates the study's primary focus on engineering education in Kerala, addressing challenges and proposing potential solutions, with implications for policymakers, educators, and industry stakeholders. Participants in the study acknowledge the multifaceted benefits of Industry-Institute Interaction (III), including practical exposure, industry-relevant curriculum, enhanced employability, networking, placement opportunities, industry projects, mentorship, support for entrepreneurship, research collaborations, and continuous professional development. We can see a very positive view of industry-institute interaction in engineering education in Kerala. If it increases employment opportunities and also codifies the syllabus in the manner required by the industries and in turn moulds the students in the manner required by the industries then it is a great honour for an educational institution, especially an engineering educational institution. It also gets a lot of support from the government in this regard. It is necessary to change any kind of communication if there are any gaps or limitations available or any other problems (Gao, 2024).

Objectives

- To investigate the integration of emerging technologies and innovative teaching methods in engineering education programs within professional educational institutions in Kerala, aiming to identify areas for improvement and enhancement.
- To scrutinize the alignment between the curriculum offered by engineering education institutions in Kerala and the evolving needs of industries, emphasizing the relevance and applicability of academic content in real-world scenarios.

Hypothesis

- H1: The level of integration between the engineering curriculum in Kerala and the Industry Institute Interaction system is insufficient, hindering the overall effectiveness of educational and industrial collaboration.
- H2: Engineering institutions in Kerala that prioritize proactive Industry Institute Interaction strategies exhibit better placement rates and career opportunities for their graduates compared to those that do not emphasize such interactions.
- H3: The lack of continuous assessment and adaptation in the engineering education system of Kerala has resulted in a widening gap between the academic curriculum and the evolving needs of industries.
- H4: Successful implementation of Industry Institute Interaction practices in Kerala's engineering institutions positively influences graduates' employability and their ability to contribute effectively to the corporate sector.

Analysis & Interpretation

The analysis and interpretation section presents the findings from the questionnaire-based study, exploring key themes such as campus placement, industry expectations, challenges in building industry partnerships, and benefits of Industry-Institute Interaction.

10.1. Institute Descriptive Analysis of the Sample Respondents of Institutions

Percentage analysis serves as a pivotal statistical tool employed to delineate the comprehensive characteristics of a given sample or population. This analytical approach entails the computation of measures pertaining to the variables under scrutiny, and its outcomes facilitate a reader-friendly interpretation of the study's findings. Table I shows the Frequency Distribution of Demographic Distribution of Respondents and Specialization

TABLE I FREQUENCY DISTRIBUTION OF DEMOGRAPHIC DISTRIBUTION OF RESPONDENTS AND SPECIALIZATION

Gender	**Frequency**	**Percent**
Male	312	68.4
Female	144	31.6
Total	456	100.0
Age slab	**Frequency**	**Percent**
18-25	408	89.5
26-40	48	10.5
Total	456	100.0
Qualification	**Frequency**	**Percent**
UG	252	55.3
PG	156	34.2
PhD	48	10.5
Total	456	100.0
Do you have any Industrial Experience?	**Frequency**	**Percent**
Yes	103	22.6
No	353	77.4
Total	456	100.0
Medium of School Education	**Frequency**	**Percent**
English	352	77.2
Malayalam	104	22.8
Total	456	100.0
Area/ Location of Institute,	**Frequency**	**Percent**
Rural	225	49.3
Urban	231	50.7
Total	456	100.0
Category of College	**Frequency**	**Percent**
Tier-1	228	50.0
Tier-2	228	50.0
Total	456	100.0
Districts	**Frequency**	**Percent**
Thiruvananthapuram	193	42.3
Ernakulam	131	28.7
Thrissur	132	28.9
Total	456	100.0
Zone	**Frequency**	**Percent**
South	193	42.3
Central	131	28.7
North	132	28.9
Total	456	100.0
Does your Institute have NAAC Accreditation?	**Frequency**	**Percent**
Yes	170	37.3
No	286	62.7
Total	456	100.0
Please do mention the NAAC Accreditation grade of your College/Institute	**Frequency**	**Percent**
A++	32	7.0
A	38	8.3
B++	34	7.5
B+	32	7.0
B	34	7.5
No Accreditation	286	62.7
Total	456	100.0
Does your College/Institute have NBA Accreditation?	**Frequency**	**Percent**
Yes	258	56.6
No	198	43.4
Total	456	100.0
How many courses in your institute/ college have NBA Accreditation?	**Frequency**	**Percent**
0	198	43.4
1	154	33.8
2	38	8.3
3 or above	66	14.5
Total	456	100.0

From the above table, 68.47 percent respondents are Male and 31.6 percent are Female. 89.5 per cent are from 18 to 25 age slab. 10.5 percent ae from 26 to 40 age slab. 55.3 per cent are UG. 34.2 percent are PG. 10.5percent are PhD. 22.6 per cent of students have industrial experience and 77.4 per cent doesn't have any industrial experience. 77.2 percent of students' medium of education was English and 22.8percent of students' medium of Education was Malayalam. The area/location of institution was Rural for 49.3 percent students and it was Urban for 50.7 percent students. 50percent of students were from Tier-1 College/institute category and 50percent were from Tier-2 College/institute category. 42.3 per cent of students were from Trivandrum colleges/institutions, 28.7 per cent of students were from Ernakulam colleges/institutions and 28.9 percent of students were from Thrissur colleges/institutions. 42.3 percent of students were from South zone colleges/institutions, 28.7 percent of students were from Central zone colleges/institutions and 28.9 percent of students were from North zone colleges/institutions. 37.3percent of students were from colleges or institutions having NAAC Accreditation (7 percent of students were from colleges/institutions having A++ grade, 8.3percent of students were from colleges/institutions having A Grade, 7.5percent of students were from colleges/institutions having B++ Grade, 7percent of students were from colleges/institutions having B+ Grade, 7.5percent of students were from colleges/institutions having B Grade) and 62.7percent students were from colleges or institutions not having NAAC Accreditation. 56.6percent of students were from colleges or institutions having NBA Accreditation (33.8percent of students were from colleges/institutions having NBA Accreditation on 1 course, 8.3percent of students were from colleges/institutions having NBA Accreditation on 2 courses and 14.5percent of students were from colleges/institutions having NBA Accreditation on 3 and more courses) and 43.4percent students were from colleges or institutions not having NAAC Accreditation.

10.2. Coding for the Variables of Hypothesis 1

To ensure code readability and professionalism, it is essential to follow standardized conventions when reading and writing code for variable declarations. Each hypothesis should be accompanied by distinct, purposeful code snippets, promoting an organized and modular structure. By adhering to clear naming conventions, consistent indentation, and comprehensive documentation, one can enhance the overall professionalism of the codebase given in Table II, facilitating

debugging and maintenance. In summary, a professional approach involves applying coding conventions, using unique codes for each hypothesis, and maintaining consistency for a cohesive and readable codebase.

TABLE II SHOWS THE VARIABLE CODES

Variables	Variable Codes
You are very familiar with the concept of III systems in your College/University/Institution.	A-OV1
The campus placement in your college is going very well.	A-OV2
The quality of education and training provided by your College/University/Institution is excellent.	A-OV3
The curriculum of your institute is very much in tune with the current industry needs and requirements.	A-OV4
Your campus placement training process has been greatly enhanced to better meet the needs of candidates with key competencies (technical skills and strong subject knowledge and attributes) expected by recruiters.	A-OV5
You are satisfied with your current campus placement drive in your college, especially in your main domain.	A-OV6
A thorough analysis of the status of your institution with respect to engineering education is required.	A-OV7
Overall, of the listed variables 1	A-OV

Medium of School Education - Independent Sample T-Test

H_0= There is no significant difference in the agreement on the III of the institution with respect to the medium school of education.

TABLE III MEDIUM SCHOOL OF EDUCATION AND AGREEMENT ON THE III OF THE INSTITUTION - INDEPENDENT SAMPLE T-TEST

Variables	Medium of School Education	Mean	SD	T - Value	P - Value
A-OV1	English	3.32	1.063	-3.426	<0.001**
	Malayalam	3.69	0.609		
A-OV2	English	3.75	0.896	-2.455	<0.014*
	Malayalam	4.00	0.965		
A-OV3	English	3.92	0.802	-1.733	0.084
	Malayalam	4.08	0.832		
A-OV4	English	3.39	1.029	1.713	0.087
	Malayalam	3.19	0.966		
A-OV5	English	3.48	0.930	-2.361	0.019*
	Malayalam	3.73	1.063		
A-OV6	English	3.42	1.127	-0.022	0.983
	Malayalam	3.42	0.889		
A-OV7	English	3.90	0.770	-3.568	<0.001**
	Malayalam	4.19	0.624		
A-OV	English	3.60	0.678	-2.200	0.028*
	Malayalam	3.76	0.603		

Source: Primary Data

The study on agreement on the Table III of the institution with respect to medium school of education revealed in table III, that in the case of A-OV1, A-OV2, A-OV5 and A-OV7 the response of students significantly differ from the one who is from English medium school and the one who is from Malayalam medium school (P-value < 0.05). While the overall result suggests that there is no significant difference between the students of English medium and Malayalam medium with respect to the agreement on the III of the institution: t (455) =-2.200, p value<0.05.

Since the results of independent sample t test depicted a P value of less than 0.05 the null hypothesis is rejected and alternative hypothesis is accepted that there is significance difference in the agreement on the III of the institution with respect to the medium school of education.

Descriptive Analysis of the Sample Respondents of Industries

Percentage analysis serves as a pivotal statistical tool employed to delineate the comprehensive characteristics of a given sample or population showed in table IV and V. This analytical approach entails the computation of measures pertaining to the variables under scrutiny, and its outcomes facilitate a reader-friendly interpretation of the study's findings.

From the below table 70.7 percent respondents are Male and 29.3 percent are Female. 32.8 percent are from 18 to 25 age slab. 55.2 percent ae from 26 to 40 age slab 12.1 percent are above 40 age slabs. 12.1 percent are UG. 50 percent are PG. 37.9 percent are PhD.

Industry Descriptive

TABLE IV SHOWS THE FREQUENCY DISTRIBUTION OF DEMOGRAPHIC DISTRIBUTION OF RESPONDENTS AND SPECIALIZATION

Gender	Frequency	Percent
Male	41	70.7
Female	17	29.3
Total	58	100.0
Age slab	**Frequency**	**Percent**
18-25	19	32.8
26-40	32	55.2
Above 40	7	12.1
Total	58	100.0
Qualification	**Frequency**	**Percent**
UG	7	12.1
PG	29	50.0
PhD	22	37.9
Total	58	100.0

Coding For the Variables of Hypothesis 1

TABLE V SHOWS THE CODE FOR THE VARIABLES

Variables	Variable Codes
The current state of III in engineering education in Kerala is excellent.	A-OV1
The approach of engineering institutes in Kerala towards III to enhance the employability of students is very effective.	A-OV2
Engineering institutes in Kerala are implementing the best practices and initiatives to improve III.	A-OV3
On campus placement, you would expect all engineering colleges to have bright students with a more technical background.	A-OV4
Initiatives by the government or other stakeholders to promote and enhance IIIs in engineering education in Kerala are very high.	A-OV5
Please indicate your level of agreement with the following statement: A comprehensive analysis of the status of professional educational institutions in Kerala regarding engineering education is necessary.	A-OV6
Overall of the listed variables 1	A-OV

Overall Study of the Variables - One Sample T-Test

Agreement on the III of the Institution - One Sample T Test

TABLE VI SHOWS ONE SAMPLE T-TEST

Variables	Mean	SD	T – Value	P - Value
A-OV1	3.10	1.334	0.591	0.557
A-OV2	3.33	0.998	2.500	0.015*
A-OV3	3.19	1.034	1.397	0.168
A-OV4	3.62	1.335	3.540	0.001*
A-OV5	3.50	0.941	4.046	<0.001**
A-OV6	4.50	0.656	17.424	<0.001**
A-OV	3.54	0.708	5.805	<0.001**

Source: Primary data

Based on the analysis table VI revealed the respondents agree to the fact that the engineering institutions have III status. Wherein A-OV6 is highest ($\bar{X}$=4.50) and A-OV1 is the least ($\bar{X}$=3.10). The analysis also indicates the result of one sample t-test where the p-value is less than 0.001. Hence it is concluded that the mean value (3.54, SD = 0.708 was significantly different from the population mean; t (57) =5.805, P-Value<0.05.

VIII. Findings and Suggestions

One of the key findings here is that the role of industry-institute interaction is significant. Not only that, its challenges and necessary suggestions for its improvement are presented here. Industry-Institute interaction has a huge impact on the field of education, especially in the field of engineering education, especially in today's modern age.

IX. Discussions and Conclusions

Through this study, we can understand how important industry-institute interaction is in the fields of engineering education in Kerala. It is also shared here that some things have been done efficiently with the arrival of KTU University here. However, the importance of industry institutes in engineering education in Kerala is generally less understood now that its importance has become widely known. It is thought that it will help in a new awakening. Still, how important it is in many other branches is also a matter of great concern.

However, for the education sector in Kerala, the industry in Kerala seems to be trying as much as possible, including the government, to shift the children in a way that suits the institutions. If we talk about what is being discussed here, it is impossible not to say how relevant an education like engineering is especially in today's times. If there is any kind of gap between education and industry, it can be resolved as soon as possible and only if that gap is filled and moved forward, then engineering education or engineering colleges can survive in the future. According to our study, we can't help but highlight some of the organizations that are doing it very successfully. That is why we can see that there is excellence in admission administration in every sense.

In an organization that can meet the interests of companies in every sense, naturally, when it comes to admission, it is impossible not to meet the quality. Then it is so important that Industry institute instruction is carried forward. Although there are deficiencies in many aspects, due to the number of children being less and the number of colleges being more, many compromises are being made in the matter of admission and the importance of this is being looked down upon. However, the effort to understand its importance and come forward is commendable.

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