

ANDROGOGICAL MEASURES TO IMPROVE EMPLOYABILITY OF ENGINEERING GRADUATES

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Abstract:

Engineering Education in India is passing through turbulent times. It is seen that since 2018 the admissions for core branches such as Mechanical Engineering, Civil Engineering and Electrical Engineering is quite less compared to Computer Science and Engineering. Currently the supply of seats in engineering institutes exceeds the demand of seats. Institutions are unable to cope up with this sudden change and have reduced their intake in core branches or have altogether gone for closure of these branches over the last four years. Employability is one of the critical component for admissions. As the economy of nations boomed the demand for automation in manufacturing, use of Artificial Intelligence, machine learning has taken a quantum jump and the major IT companies over India had large hiring in these four years. In this work, the issues faced about employability of engineering graduates have been viewed from androgogical perspective and brainstorming was conducted with the stakeholders to arrive at the various issues ahead and the way to address the same. 26 measures were suggested by the various stakeholders be in alumni, parents, employers, training organizations, faculties. Google form was sent to the faculty members to solicit their opinion on the 26 points and Lickert scale of 1-5 rating was used to get the responses. Responses for 40 respondents (covering 6 Indian states) are analysed and the results are quite similar. 90% respondents agree that setting of new high tech labs and training for skill development, placement opportunities (Robotics, 3D Printing, Total Station QGIS, Revit, Sketch up), Functional MoUs with industries can help improve employability (with 70 % strongly agreeing). 90% respondents agree that finding out good sincere students (10-20%) i.e. segregation and grooming them in their field of interest, future plans can improve the knowledge, skill, attitude (KSA) for employment (with 50% strongly agreeing). 90% respondents agree that Self discipline /self management among students, attendance in college and responsibility in learning impact KSA of students (with 50% strongly agreeing). These responses are indicative that institutions need to align themselves in the changing times to make their students employable.

Key words: Androgogical Measures, Engineering Education, Employability, Engineering Graduates.

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Introduction:

Engineers play a vital role in improving the quality of human life and India is one of the largest producers of engineers with 23 IITs (Indian Institute of Technology), 31 NITs (National Institute of Technology) and state universities offer technical education in the form of undergraduate, graduate and postgraduate programs [1].

Since India, a predominantly young population, IITs and NITs are not sufficient in number and hence AICTE (All India Council for Technical Education) has approved over ten thousand self-financed private engineering colleges across the country to cater the huge demand for engineering education. Most of the existing engineering colleges failed to give quality education to the students, which would get them suitable jobs. As per the research carried out by Aspiring Minds a leading employability assessment company, only 1.7 percent of the engineering graduates are suitable for the new age jobs and top 10 IT companies recruit only 7 percent of the engineering graduates every year which is a serious concern [2]. It has been observed that 94 percent of engineers are not fit for hiring because of lack of skill set and substandard engineering education [3]. In order to improve the skill set of the students and increase the percentage of employable graduates, it is high time for disruption in the process of engineering education in India. Learning Analytics will provide an understanding and optimization of learning and its environments thereby ensuring sustainable development. This analysis presents an opportunity to identify the gap between the academic curriculum and the industry's expectations in terms of competency skills to be acquired by the learners. Additionally, it helps to improve the teaching-learning process and helps in lifelong learning [4]. The progress of any nation in today's era is driven by technology. Engineers are instrumental in driving this technological change. Hence employability and availability of opportunities to young graduating engineers is crucial. Employability is the corner stone for enrolments. Today the % of students opting for higher education and self employment i.e. entrepreneurship are quite less when compared to companywide placements. Sound Technical Knowledge is paramount for employment. Attitude of young students is also key factor as nearly 75% of the students hired by mass recruiters in India do not show up for on boarding. Soft skills, self management, self discipline contribute to this. It is felt that teachers are not updating themselves to the requirements of industry, research organisations on a regular basis post employment and as such are unaware of market demands. Information is not available and hence institution managements do not have correct or complete picture of the growth trajectory of employment, various sectors and nation at large. Top level positions in industry are scouting for talent but wanting for talent, whereas the mass recruiters are getting good response to their selections. There are many variables (26 No's) which as per experts may contribute to employability of fresh engineering graduates.

Methodology:

In this work, the issues faced about employability of engineering graduates in India have been viewed from androgogical perspective. Brainstorming was conducted with the various stakeholders of engineering education be it academic administrators, faculty, students, employers to arrive at the various issues ahead and the way to address the same. Stakeholders viz alumni, parents, employers, training organizations, faculty members suggested 26 measures. To solicit the opinion of experts, a Google form was formed covering the 26 issues and an open option was kept to suggest any other measure apart from the ones mentioned in the form. Google form was sent to the faculty members in various states to solicit their individual opinion on the 26 points. Lickert scale of 1-5 rating was used to get the responses.

Results and Discussions:

The 20 issues which were brought out by the stakeholders and responded by faculty vehemently are as under

1. Setting of new high tech labs and training for skill development, placement opportunities (Robotics, 3D Printing, Total Station, Revit, Sketchup), Functional MoUs with industries can help improve employability
2. Finding out good sincere students (10-20%) i.e. segregation and grooming them in their field of interest, future plans can improve the knowledge, skill, attitude (KSA) for employment
3. Self discipline /self management among students, attendance in college and responsibility in learning impact KSA of students
4. Periodical exposure, training about Employability options, GATE/CAT/TOEFL/GRE, UPSC, MPSC, New technologies introduced can improve skills for employability in student community
5. Creating awareness about resource, time scarcity to students so that they can make judicious use of the same. 4 years is important part of their lives. This awareness hammered time and again can make them focus on utilisation of time, talent and resources to improve KSA
6. Training the students on the wide Gap existing between industry skill sets demands and curriculum can improve employability
7. Proper & Immediate decision making by managements/administrators can help in smooth functioning. Proper priorities of management can improve employability
8. Increasing awareness about ill effects of time, talent wastage by students in social media, TV which are mostly distractions
9. Institution administration/ management play a major role in decision making regarding faculty recruitments, retention. Proactive administration can improve proper talent acquisition and talent retention, so that these can be used to give better inputs to students on employability
10. Regular feedbacks on faculty, statistical analysis and corrective actions so that we are well connected with students can improve productivity of teachers and their contributions to students for their future
11. Core branch engineering program students curriculum does not include the current trending software's. Procurement, training of students in these emerging software's can help employability
12. Long procurement processes in various institutions for lab equipment's, consumables, other materials can lead to lack of development of department, institution and hence affects quality inputs to students
13. Focus on daily classes taken both on quality and quantity (AAA), placement oriented teaching by institution can keep the faculty motivated to give their best to students and hence improve their employability
14. Frequent attrition of faculty (Faculty leaving the institution) affects the morale of students and hampers employability
15. Exposing students to national level competitions SAE Baja, Supra, Hackathons can improve their knowledge, Skills and team workings ethos which help in good placements
16. Improving the skills of teachers by FDP, Workshops so that teacher can conduct research and publish and improve his KSA to give better inputs to students
17. College level awards for best student and best faculty monthly / semester can help students and faculties to contribute and grow together and ensure better transfer of KSA to students
18. Androgical initiatives for teachers (How we teach) will help them deliver good lectures and connect well

- with the students. Team working skills, Interpersonal skills training can also help teachers give in their best
19. Quality implementation of Curriculum, flexible and real life oriented including industry modules like SIEMENS, Bosch, and Infosys etc Students Projects should be seriously taken to ensure improving the KSA of students to make them employable
 20. Quality infrastructure and facilities for teachers and students if arranged by the institution can pave for better academics and thus improve the prospects of employment

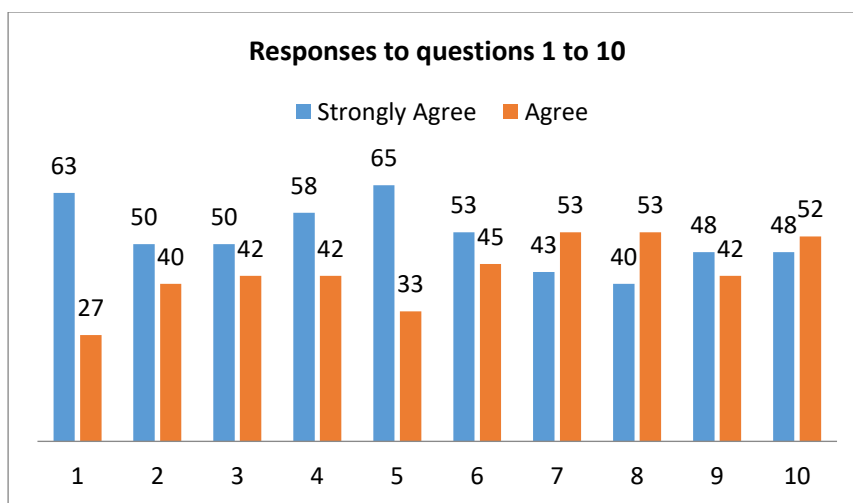


Fig 1 : Responses of faculty members to the initial 10 questions

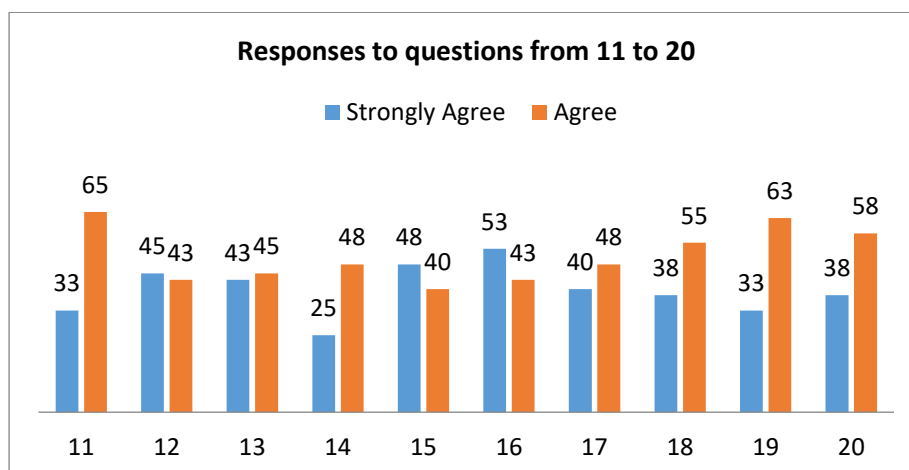


Fig 2 : Responses of faculty members to the final 10 questions

The study shows that the 20 points listed above are important from the stake holders point of view with the score for strongly agreeing and agree put together varying from 73-100 with an average of 93. Its high time that academic administrators take note of the changing dynamics in this VUCA world and adapt themselves to sustain and thrive in the higher education sector by adopting various androgogical measures as needed by the students fraternity.

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