The Employable Graduate: Industry Engagement Through Planning, Practice, And Performance

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Abstract- This paper explores employable graduates for defense industries via placements at Cordite Factory Aruvankadu and Arista Academy Namakkal. Emphasizing planning, practice, and performance cycles rooted in experiential learning (Kolb's model), it bridges academia-industry gaps, fostering technical skills, adaptability, and signaling for work-readiness amid evolving demands.

I. INTRODUCTION

The notion of the employable graduate has become a central theme in the discourse on higher education and its relationship to industry needs, Especially for defence industries In an increasingly competitive global labor market, employers are no longer satisfied with graduates possessing only disciplinary knowledge, with mere degree, but with Skilled person for technical competence. They expect an integrated professional identity where individuals demonstrate a deep awareness of Defence industry requirements, a well-refined sense of self, adaptability in the face of change, relevant practical experience, and the capacity for reflective practice. Collectively, these elements signal whether graduates are work-ready and capable of contributing productively to organizational goals from the outset of their employment.

In higher education contexts, such qualities are often articulated under the umbrella of graduate attributes or capabilities. These attributes encompass a broad range of skills, initiatives, willingness, attitudes, and dispositions that extend beyond academic knowledge. While technical knowledge remains vital, it is increasingly recognized that factors like communication, teamwork, ethical awareness, problem-solving ability, and resilience are equally important for today's compulsion. Fundamentally, graduate attributes represent the means by which universities attempt to demonstrate both to students and to external stakeholders that their degree programs cultivate individuals prepared not only to enter but also to thrive in professional environments.

II. PLACEMENTS IN DEFENCE INDUSTRIES AS A BRIDGE BETWEEN ACADEMIA AND THE WORKPLACE

Within this evolving framework, Defence industry placements hold a central place. They are more than temporary attachments to workplaces; they are dynamic Didactic spaces where theory and practice intersect. Internships allow students to move beyond hypothetical or classroom-based applications and hands on training knowledge and instead immerse themselves in the realities of Defence industry practice. Through internships, cooperative education, or structured industrial training programs. The Pattern of placements are designed to provide authentic, context-specific experiences that demand initiative, adaptability, Self-confidence and professional communication from each candidate.

The 'significance of such Internship' and placements lies in their transformative potential. Number one, they offer students an opportunity to apply disciplinary knowledge practically. For example, an technical studies student does not merely solve current scenario and academic problem sets but works with industry-grade machinery, follow safety standards, problems or challenges faced, and responds to real-world project timelines. A business studies student does not only analyze case studies but interacts with clients and understands market dynamics. Through

such exposure, students develop practical competencies that cannot be replicated easily in classroom contexts.

Number two, Knowledge on Defence Industries industry placements allow students to gain confidence in their skills, and often shifting their self-perception. Many students enter placements uncertain about their ability to apply their knowledge. The structured challenge of placement is combined with guidance from supervisors and mentors helps them to see themselves as to learn the complex concept to become as professionals. This enhanced sense of identity cultivates an ongoing readiness to take responsibility and adapt to unfamiliar situations.

Number three, Defence internships, placements and foster employability signalling. In an era where employers sort through thousands of applications, a graduate's ability to demonstrate evidence of industry-relevant experience becomes a decisive factor. Placements enhance students with qualities of competence, concrete examples of professional solutions to challenges faced, and proof of resilience. Such experiences not only strengthen resumes but also provide ability for Skill set, job interviews and portfolio development, thereby indicating to employers that the graduate has already begun the transition from academic learner to industry participant.

III. EXPERIENTIAL LEARNING AS A FOUNDATION

To Provide experiential learning and skill set to the students the weapon and allied weapon manufacturing factories were chosen like Cordite Factory, Aruvankadu, The Nilgiris District and Arista Academy Drone manufacturing company located at Namakkal. The Survey on Cordite factory and Arita Academy Reveals the following expects.

The Cordite Factory, Aruvankadu (CFA), is a historic Indian defence establishment now operating as a unit of the Public Sector Undertaking, Govt of India.

Fig: 1

IV. OVERVIEW AND HISTORY

- Location: The factory is located in Aruvankadu, a village in the Nilgiris District of Tamil Nadu, situated between Coonoor and Ooty. It was established by the British government in 1903-1904 and is the first smokeless propellant factory in India. The site was chosen due to its favorable climate in the coonoor for the manufacturing process. Initially under the Ordnance Factory Board (OFB), in 2021, the government corporatized the OFB's production units. The Cordite Factory now functions under the administrative control of Munitions India Limited (MIL), one of the seven new Defence Public Sector Undertakings (DPSUs).

V. PRODUCTION AND PRODUCTS

The factory specializes in manufacturing propellants for various types of ammunition for the armed forces.

- Propellants: It primarily manufactures double-base and triple-base propellants, which are forms of smokeless propellants used in small arms ammunition like and as a main charge for artillery and Battle tank ammunition.
- Key Ingredients: The production process involves manufacturing key energetic materials like nitrocellulose and nitroglycerine, which are then mixed with other ingredients and stabilizers (e.g., petroleum jelly) to create the propellants.
- Bi-Modular Charge System (BMCS): CFA produces propellants for the Bi-Modular Charge System (BMCS), which are sent to other facilities (like Ordnance Factory Nalanda) for final

assembly. The factory has the capacity to produce 1000T of BMCS propellant annually.

- Other Products: Any surplus capacity can be used to manufacture industrial nitrocellulose for non-defence sectors such as paints and cosmetics.

VI. OPERATIONAL ASPECTS

- Workforce: The factory employs over 2,000 workers, including 362 women employees. Further, The factory has undergone modernization programs to upgrade its plants and infrastructure, including the nitrocellulose plant, electrical systems, and transportation.

- Quality and Safety: As a defence establishment, the factory adheres to strict safety and quality assurance protocols. Products undergo rigorous quality checks by agencies like the Directorate General of Quality Assurance (DGQA), and employees receive regular safety training for working in explosive areas.

- Logistics: Due to its location in a hilly region, transportation of materials and finished products, especially using large trailers, are unique logistical challenges.

ARISTA Drone Training Facility Report

Approval and Compliance

ARISTA is approved by the Directorate of Civil Aviation (DCCI). The license requires renewal every 10 years, with annual inspections conducted to ensure compliance – Located at Tiruchengode road, Ayyampalayam, Namakkal.

Fig:2

Training Infrastructure and Personnel

- Training utilizes a 150 kg weight drone.
- Four trainers oversee operations: Dr. Pitha, Vetri, and Guru. They have a track record of Providing Training and
- Documentation is maintained for 5 years.

Facility Layout and Resources

Learnt the following expects of Arista Academy

- Storage Room: Equipped with a scanner and fire-protected safe (bero).
- Battery Room: Houses 35–40 batteries.
- MRO Room: Dedicated to drone service and maintenance, including Agri Drones with 10-liter capacity. Staffed by Kathir and Pram.
- They have a Simulator Room which is Used for flying training simulations, practicing maneuvers such as figure-8, rectangle, circle, right turns, and left turns, through computers.
- E-Library: Contains resources on aviation and meteorology, including books, PDFs, and notes.
- Smart Classroom: Used for 20 participants at a time. Covers Survey Mapping drones for volumetric measurements and land surveys.

Training Programs offered by the Arista Academy are Primary training focuses on:

- Survey mapping
- Aerial cinematography
- Maintenance, repair, and operations (MRO) to provide support and facilitating survey.

The Advanced (second-step) training options include:

- Drone forensics course module,
- Drone investigation course module,
- Drone as a Service (DaaS)
- Drone Centre of Excellence (CoE) to enable trainees to learn through handling various kinds of Projects/ Onsite inspections etc.

Training being provided to various Government agency like Survey department and Non – Governmental agencies.

Participants completing basic training may select specialized next-level courses based on their interests.

Manufacturing Note

Drones are assembled on-site using materials sourced externally.

Underlying the value of Internships for placements are the principle of experiential learning. This is taken from Koll's cycle of experiential learning. Drawing from Kolb's well-cited learning cycle, These experiential learning occurs when individuals engage in a Accomodating, Diverging, Assimilating and converging concrete experience. It reflect upon, abstract concepts, and then test these in new situations. Placements inherently support this cycle. Students engage in activities that challenge prior assumptions or knowledge, which reflect upon successes and difficulties, formulate new strategies, and then apply these strategies in subsequent given tasks.

Secondly, experiential learning encourages adaptability which has a key indicator of employability. Rapid transformation through technical knowledge and shifting them into Analistic Industry technological revolution and shifting its landscapes which no degree procides students fully for every eventuality of their careers. Universities normally can do, prepare students to learn continually from their own experiences. Internship and Placements embody this preparation by forcing students out of standardized routines and into adaptive, real-world contexts.

Thirdly, experiential learning is seen as the logical and even expected outcome of effective higher education–industry engagement. Institutions that fail to provide applied opportunities which made their graduates underprepared and vulnerable in the transition to full-time employment. On other hand, institutions with robust placement programs signal their responsiveness to employer needs while at same time strengthening graduate capacity to adapt and succeed.

Planning, Practice, and Performance: A Cyclical Model

The role of Defence industry placements through three interconnected Aspects of dimensions: ie..planning, practice, and performance. These stages operate as a cyclical model that facilitates the translation of theory into meaningful workplace contributions.

Firstly,

Planning: Effective placements do not occur by chance. They require Proper careful design that balances the needs of students, industry partners, and universities. Planning involves identifying clear learning objectives, preparing students with necessary pre-placement skillsets, and matching them with organizations whose needs align with their discipline. For students, planning also involves cultivating awareness of personal strengths and weaknesses, clarifying career aspirations, and setting goals for development during the placement.

Secondly The placement is conditioned by the set of practice. Here, students engage with Defence industry professionals, undertake tasks of increasing complexity, and apply their disciplinary knowledge in live projects. Practice emphasizes not only technical application but also exposure to workplace culture, teamwork, ethical decision-making, and professional communication. Mentoring and feedback during this stage are essential to ensure that students learn from challenges rather than feeling overwhelmed.

Finally, the Performance: It reflects through evaluation, and signalling. After completing industry experiences, students should be encouraged to analyze their own performance critically. Check that their academic knowledge applied effectively? Where did they struggle and how did they overcome challenges? What feedback did they receive, and how can it shape future development? This reflective practice not only consolidates learning but also allows students to articulate their experiences compellingly to future employers. Performance thus represents the point at which employability is demonstrated and is ensured.

This framework is cyclical in any stage student is assessed his/her and attempts for incompetently, They will repeat the cycle to prove their performance. Through repeated cycles, students develop a portfolio of experiences that demonstrate depth, adaptability, and resilience hallmarks of employable graduates.

Aligning Higher Education and Industry Expectations:

A persistent recurring challenge within graduate employability is the perceived gap between industry expectations and syllabus/ curriculum of higher education. Employers often report that graduates lack practical skills, while universities emphasize the broad intellectual and disciplinary training they provide. This misalignment can lead to frustration on both sides. Industry placements, when implemented

thoughtfully, serve as a mediating platform. Hence universities to remain committed to disciplinary and curriculum with rigor while simultaneously embedding real-world expectations into student learning, through Internship.

Successive outcomes depend on collaboration between Academic and Industries at this interface. Collaboration is key at this interface. Universities may try to engage Defence industry partners not merely as hosts but as co-educators who contribute to shaping the student into real experience. Similarly, industry must be willing to invest in mentoring, training, and feedback, finding recognizing that placements are long-term investments in talent pipelines for a institutions. When both sectors align their perspectives, graduates enter the workforce with more realistic expectations and employers benefit from a generation of professionals capable of contributing immediately yet ready to grow further.

Guidance for Stakeholders:

The journey to developing an employable graduate entails contribution from multiple stakeholders. For students, intentionality is crucial they must approach placements not merely as graduation requirements but as transformative opportunities to learn, grow, and demonstrate. For faculty, structured support before, during, and after placements ensures that academic and industry components elements remain interconnected. For industry hosts, creating inclusive, challenging, and supportive environments maximizes the benefit of placements for both student and Industries.

Guidance in this domain must therefore emphasize with clear communication in respect to ongoing mentorship, and mechanisms for reflection. Tools such as reflective journals, post-placement debriefs, competency frameworks, and career workshops can extend the value of industry experiences beyond the temporary duration of the placement.

VII. CONCLUSION

The employable graduate in the future will not be defined by technical mastery or disciplinary expertise provided by the Universities, but by their ability to navigate complexity, reflect on experience, adapt to change, and signal their value effectively to employers which they acquire Skill set. Industry placements represent a vital vehicle through which these capabilities are developed. By adopting cyclical models of planning, practice, and performance, higher education institutions can provide students with ample opportunities to apply theory in practice, evaluate their growth, and prepare for ongoing employability in the dynamic labor markets.

Employability is not a single event but a trajectory. Universities that integrate industry placements as core features of their curricula will be best positioned to support graduates in achieving both immediate work-readiness and long-term adaptability. Aligning the needs of academia, industry, and students through carefully structured placements ensures that higher education fulfills its dual promise: academic excellence alongside professional preparedness.

Now a day the higher education institutions are incorporating student Industry coordination in the curriculum framework on daily basis. Internship during every semester vacation is made mandatory. Certain courses offer Internship cum Project work for entire semester in an Industry in India, and in some areas in Foreign Universities.

Key words: Industry-academia collaboration, Planning-practice-performance,Cordite Factory Aruvankadu, Arista Academy drones, Graduate attributes, Work-readiness skills.

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