

# A Novel 360° Framework for Developing a Graduate as a Whole Person by Enhancing the Affective Domain Skills

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**Abstract:** “It takes more than intelligence to act intelligently”. An education that enriches and kindles the thinking ability of a person and ignites not only the knowledge but also the skills and attitude to draw to an innovative conclusion with holistic development is termed Whole Person Education (WPE). A framework for achieving a 360-degree development of a student is devised and used. This framework consists of 14 indicators that are mapped with the Graduate Attributes (GA) defined by NBA. These 14 indicators include research, advanced studies, industry interactions, publications, IPR, sports, and other life skills such as communication, leadership skills, teamwork, and character building.

**Keywords:** Whole Person Education, Affective Domain, Performance Indicators, Attainment of Program Outcomes, Graduate Attributes, Cognitive Domain, Psychomotor Domain, Rubrics, Accreditation.

## 1. Introduction

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Education in Asia, the whole person education aims at developing an individual holistically. It fosters critical thinking and challenges students to make decisions on their own to solve problems. In addition to knowledge development, it also aims at the exploration of ethics and service. It guides institutions towards a commitment to developing sound citizens. It makes students develop themselves into citizens who are sensitive to the needs of the surrounding society. Whole-person education also embraces the intellectual breadth and values of liberal arts education, while accommodating challenges, opportunities, and traditions distinctive to the cultures, societies, and institutions where it takes root.

All graduates of any higher education programs are expected to have identified technical/functional, generic, and managerial competencies. The competencies that a graduate of a program should have are called Graduate Attributes. The Attributes a graduating engineer should have, are generally identified by the Accreditation Agency for Engineering and Technical Education, namely, the National Board of Accreditation (NBA) in India. The Graduate Attributes as stated by NBA are in the spirit of Program Outcomes as stated in Washington Accord (Graduate Attributes are referred to as Program Outcomes by Washington Accord). The 12 graduate attributes used as Program Outcomes by all engineering institutions are Engineering Knowledge,

Problem Analysis, Design and Development of Solutions, Investigation, Modern Tool Usage, Engineering and Society, Environment and Sustainability, Ethics, Individual and Team Work, Communication, Project Management & Finance, and Lifelong Learning.

## 2. Literature Review

Whole-person education is an approach that emphasizes the holistic development of learners, integrating intellectual, emotional, social, and physical aspects of their lives. This literature review examines the theoretical underpinnings, pedagogical approaches, and outcomes associated with whole person education in higher education settings. Zepke and Leach's provide insights into the theoretical frameworks, pedagogical approaches, and outcomes associated with whole-person learning. They highlight the importance of engaging learners intellectually, emotionally, and socially, as well as the need to integrate experiential and reflective practices. The review emphasizes the transformative potential of whole-person education in promoting deep learning and personal growth (Zepke, N., and Leach, L., 2013). Outcome based education aims at enhancing educational quality focusing on the cognitive domain. Learner-centered teaching methods such as jigsaw-based cooperative learning promotes peer teaching and interaction. Such methods are also highly effective in improving the performance of the students (Ragupathy, U. S., Suji, P. S. J., Venkatesan, B., Abirami, T., Vijay, A. D., and Jeevanantham, A. (2023). The concept of whole person education has emphasized the need to reconnect the cognitive, affective, and psychomotor domains of learning. By integrating these aspects, educators can create a more holistic and transformative learning experience for students. The importance of fostering self-awareness, empathy, and ethical reasoning are also emphasized in whole person education (McGrath, S., and Powell, S., 2017). An integrated teaching strategy with application-oriented teaching that involves the students in solving problems of the society in different domains is essential in the case of engineering education. Such strategies make students show interest and engagement with better comprehension of abstract principles (Sivaprakasam C., Dargar, S.K., and Nagarajan, N., 2024).

Chen and Pang explore the dimensions of whole person education and examine the strategies used in

higher education institutions to promote holistic development among students. They highlight the significance of learner-centric approaches, interdisciplinary learning, and co-curricular activities in fostering whole person education. The review also identifies the challenges and opportunities associated with implementing this approach in higher education (Chen, X., and Pang, M. F., 2017). Another research presents a case study focused on cultivating whole person education within the context of a liberal arts college. The study explores the implementation and impact of a holistic educational approach that aims to develop students intellectually, emotionally, socially, and morally. Through a qualitative investigation, the authors analyze various aspects of the college's curriculum, pedagogy, and student support services, as well as the perceptions and experiences of students, faculty, and administrators. The findings highlight the importance of integrating academic learning with personal growth and character development, fostering a supportive and inclusive learning environment, and promoting students' holistic well-being (Chen, Z., and Zang, Y., 2019). Brown and Delgado, examine the role of student affairs professionals in fostering whole-person education. The paper emphasizes the significance of creating supportive campus environments, promoting student engagement, and facilitating meaningful student-staff interactions. It also highlights the importance of assessing and evaluating the impact of student affairs initiatives on students' holistic development (Brown, G. E., and Delgado, N. V., 2021).

Suskie, L. discusses the challenges and opportunities in assessing student learning outcomes in higher education, including the alignment of outcomes with institutional goals, the selection of appropriate assessment methods, and the use of assessment results to improve program effectiveness (Suskie, L., 2009). Andrade, H. L. explores the use of rubrics as a tool for assessing program learning outcomes in higher education. It discusses the benefits of rubrics, provides guidance on developing and using rubrics effectively, and highlights examples of rubric-based assessment in different disciplines (Andrade, H. L., 2005). Project-based learning approaches with agile methodology can effectively make the students industry-ready. A well-defined rubric based assessment can provide a simple and more reliable way to measure the performance of a student contributing to more accurate and equitable evaluations (Deepa, M., Susithra, N., Santhanmari, G., and Reba, P. 2024).

Smith, J. A., Jones, B. D., & Armstrong, P. I. examine the impact of program-level assessment on student learning outcomes in higher education. It explores the relationship between assessment practices, instructional strategies, and student achievement, and provides recommendations for improving assessment processes (Smith, J. A., Jones, B. D., and Armstrong, P. I., 2017). Hernandez, J. M., and Neely, E. A. focus on the importance of closing the assessment loop by using assessment results to improve program outcomes in higher education. It discusses strategies for analyzing assessment data, implementing changes based on findings, and engaging faculty and stakeholders in the assessment process (Hernandez, J. M., and Neely, E. A., 2011).

Thompson, B. L., and Montgomery, S. examine the implementation of program-level assessment in a higher education institution. It explores the benefits and challenges of using program-level assessment to enhance student learning and discusses strategies for engaging faculty and promoting a culture of assessment (Thompson, B. L., and Montgomery, S., 2015). In the book "Using Assessment to Support Student Learning" educational researcher Graham Gibbs highlights the significance of assessment in improving student learning in higher education. It offers practical methods, backed by research, for educators to effectively use assessment to enhance student outcomes (Gibbs, G., 2010).

In addition to academic coursework, students can engage in non-academic activities like extracurriculars, volunteering, internships, and leadership roles. These experiences offer crucial chances for students to enhance vital qualities necessary for graduating, such as skills, knowledge, and values (Kuh, G. D. et. al., 2008). Hendricks, Robins, and Winterton examine how different colleges and universities (higher education institutions) design, carry out, and assess experiential learning programs. They looked at how these institutions encourage students to actively participate and how these programs enhance student learning (Hendricks, C., Robins, L., and Winterton, J. 2017).

Jones J investigated how colleges and universities can integrate non-academic activities into their programs to promote well-rounded student experiences. Through interviews and case studies, he showed that activities like clubs, community service, internships, and leadership roles should be included in course plans, extracurricular programs, and school

rules. By embracing these activities, institutions can encourage students to grow as individuals, get more involved, and learn more effectively (Jones, J., 2011). "Exploring Leadership" by Komives et. al. is a book that helps college students become better leaders who can make a positive difference in their communities. It teaches students about different leadership theories, styles, and approaches. It also covers the importance of ethical leadership, social responsibility, and collaboration. The book includes exercises and case studies to help students learn and reflect on their own leadership skills (Komives, S. R., Lucas, N., and McMahon, T. R. 2005).

### **3. Attainment Of Graduate Attributes (ga) And Program Outcomes (pos)**

Out of these twelve attributes, the first six attributes are knowledge-based attributes or cognitive domain attributes, which can be attained by a graduate in a classroom environment through the completion of courses, projects, laboratory sessions, and so on. But the remaining six attributes are attitude-based attributes or affective and psychomotor domain attributes and cannot be attained through classroom learning alone. Experiential learning is required for a student to attain these attributes. This study offers a novel framework to help aspiring engineers methodically develop attitude-based skills. This framework suggests a 14-point indicator system that can train a student toward attaining these attitude-based attributes belonging to the affective domain. The 14-point indicators are elaborated on in detail as follows:

#### **3.1 Indicator 1: Clubs/Societies/NSS/NCC**

A student can develop Engineering Knowledge by getting involved in activities through various clubs, societies, NSS, NCC, and so on. A 10-point score scale is proposed to evaluate and grade the skills attained by the student. The rubrics are defined in Table 1. For example, a student, who becomes a member of any club or attempts to join NSS/NCC will be getting 1 point. If he is an office bearer in professional and societal clubs or a member of NSS or NCC he will be getting 2 points. A student can earn 3 points by organizing team events or competitions, or participating in NSS camps, or participating in Rifle Shooting Camps in NCC. The events can be at the organizational level or regional level or national level. 4 points can be awarded to students for participation in events organized by universities as a club or for

winning in events organized by clubs in other affiliated colleges. A student can earn 5 points by participating in NSS Camps or NCC-CATC camps 5 points can also be awarded to winners in Club events organized by other Universities. A student involved in these activities can acquire graduate attributes such as Communication, Environment and Sustainability, Ethics, Individual and Teamwork, Project Management & Finance, and Lifelong Learning.

### 3.2 Indicator 2: Sports, Games/Athletics

**Table 1 : Clubs/societies/nss/ncc**

| Descriptor  | Score (in points) |
|---|-------------------|
| Member in clubs (one point for every two clubs) / Attempted to join NSS / NCC.  | 1                 |
| Office bearer in Professional & Societal Clubs/Member in NSS / NCC.   | 2                 |
| Organizing Team Events & Competitions / Participation in NSS Camp / Rifle/ Shooting Camp in NCC.  | 3                 |
| Participation in events organized by universities as a club/ NSS/ NCC / Winners in Club events organized by other Affiliated colleges.      | 4                 |
| Participation in NSS Camps/ Winners in Club events organized by Universities / Participation in NCC-CATC camp.                              | 5                 |
| Organizing Awareness Rally / Campaigns to emphasize ethical practices.  | 6                 |
| Participation in NCC Trekking Camps/Camp organizer for NSS/ Winners in Club events organized by other Universities.                         | 7                 |
| Securing B Certificate / Continuous Involvement in NSS (Second Year also) /Winners in Club events organized by National level institutions. | 8                 |
| C Certificate in NCC or NIC Camp / Frequent blood donor/Organizing externally sponsored club events.  | 9                 |
| Outstanding performance in clubs/ Outstanding performance in NCC or RD Camp Participation / NSS.  | 10                |

The second indicator is the involvement of students in Sports, games/athletics. The activities prescribed under this category help the students to achieve graduate attributes such as Teamwork, Communication, and Ethics. The rubrics for these activities are explained in Table 2.

### 3.3. Indicator 3: Class Responsibilities/ Association/ College Events

The next indicator is based on the involvement of the student in class responsibilities or association or college events. This indicator helps the students to achieve GA's such as Ethics, Individual and teamwork, communication project and finance

**Table 2 : Sports, Games/athletics**

| Descriptor   | Score (in points) |
|--|-------------------|
| Participation in regular sports activities (Attendance - 80 %) / Intramural Participation.   | 1                 |
| Intramural Medalist.   | 2                 |
| District / Zonal level Participation (Representing the College team/ Individual).  | 3                 |
| District / Zonal level medalist or Prize winners.  | 4                 |
| Inter Zonal / State level participation (Representing College / District team).  | 5                 |
| Inter Zonal / State level prize winners / South Zone Inter University / South India Level Participation (Representing Anna University / Tamil Nadu State). | 6                 |
| South Zone Inter University / South India Level Prize Winners.   | 7                 |
| All India Inter University / All India / National Level Participation.   | 8                 |
| All India / Inter University / National Level Prize Winners.   | 9                 |
| Participating in the Indian team (International level participation- Individual or Game).  | 10                |

management, and also lifelong learning abilities. The rubrics for this indicator are explained in Table 3.

### 3.4 Indicator 4: Students' Symposia

The next two indicators motivate the students to get involved in research activities through

**Table 3 : Class Responsibilities / Association / College Events**

| Descriptor  | Score (in points) |
|---|-------------------|
| Volunteer in College Events.  | 1                 |
| Class Representative / Association Office Bearer / Committee Member in Department activities / Canvassing / Campaigning for Career Guidance Programs.                         | 2                 |
| Coordinator in college Committee / Career Guidance Events.  | 3                 |
| Steering Committee Member / Convener in Career Guidance Events / Office bearer in Student's chapters of professional bodies.  | 4                 |
| Overall Event coordinator / Coordinator in International Conferences & Seminars organized by the organization.  | 5                 |
| Overall Event Coordinator for National level program – Outside the organization / Co -ordinator in National Symposium / Project Design Contest Organized by the organization. | 6                 |
| Coordinator in National Symposiums / Project Design Contests organized by the organization.   | 7                 |
| Overall event coordinator for National level programs.  | 8                 |
| Organizing National Conferences / Seminars through Professional Societies / Chapters  | 9                 |
| Organizing International Conference / Seminar through Professional Society /Chapters.   | 10                |

publications and participation in conferences and symposiums. This helps students to achieve all the 12 GAs and POs. This indicator also encourages students to participate in co-curricular activities such as participation in various activities and enables them to get involved in various research activities that are carried out in their institutions. Table 4 lists the scores for this indicator.

### 3.5 Indicator 5: Publications/Conference

Students learn better by doing hence this indicator

**Table 4 Paper Presentation (students' Symposia)**

| Descriptor  | Score (in points) |
|---|-------------------|
| Classroom presentation (one point per subject) for I Year only (to be authorized by subject faculty)  | 1                 |
| Intra-departmental presentations (for every 2 competitive events).  | 2                 |
| Inter-departmental presentations (for every 2 events) / Inter-college events / Presentation in any other colleges*.                             | 3                 |
| Poster Presentation in Affiliated Colleges (for I & II Years only) / Best Poster Award (III & IV Year).   | 4                 |
| Presentation in Affiliated colleges (for every 2 presentations for non-prize winners)   | 5                 |
| Presentation in Universities / Winners in affiliated colleges (as R5).  | 6                 |
| Winners in Universities (other than IIITs, IISER, IIST & IITs) / Presentation in National Institutions (IIITs, IISER, NITs, NIFT, IIST & IITs). | 7                 |
| Winner in National Institutions.  | 8                 |
| Participation in International Symposia held abroad.  | 9                 |
| Best Paper Award in International Symposia held abroad.   | 10                |

allows them to attain the POs but also helps in acquiring various life skills that are much needed to face the competitive world. The rubrics for this indicator are given in Table 5.

**Table 5 Publication/conference**

| Descriptor   | Score (in points) |
|--|-------------------|
| Editorial Board Member   | 1                 |
| Contribution to Department Newsletter (2 successive issues) / Contribution to College Annual Magazine / Poster Presentation in National Conference | 2                 |
| Paper Presented at National Conference / Publication in Popular Magazines / Poster Presentation at International Conference.                       | 3                 |
| Paper Presented in International Conference in India in Affiliated Colleges / Papers Published in Institute - Level Journals.                      | 4                 |

|   |    |
|---|----|
| Paper Presented in International Conference organized by NITs / Papers Published in Professional Society Journals (Non-impact factor).    | 5  |
| Papers Published Peer-reviewed Journals (Non-impact factor) Paper Presented in International Conference organized by IIT/IIIT/IISER/IIST. | 6  |
| Paper Published in Peer-reviewed Journals jointly with Faculty Member (Two faculty authors only).   | 7  |
| Paper Published in Peer-reviewed Journals jointly with Faculty members (Max. Three Student Authors and one Faculty Member).               | 8  |
| Paper Published in Peer-reviewed Journals – Single Author Publication.  | 9  |
| Citation Index in Peer -reviewed Publication (Scopus, SCI)  | 10 |

### 3.6 Indicator 6: Participation in Technical Events

“Participation is more important than winning”. When students are encouraged to move out of the campus and are permitted to participate in technical events conducted across the globe, they not only get an opportunity to exhibit their talents but also develop a network of connections with the outside world which helps them to work collaboratively in their academics and research. The detailed rubrics for this indicator are given in Table 6.

### 3.7: Indicator 7: Participation in Non-technical Events

Students may also be encouraged to participate in

**Table 6 : Participation In Technical Events**

| Descriptor   | Score (in points) |
|--|-------------------|
| Organizing committee Member* / Participant in Technical Events* /Participation in Outside Events (For II/III Years only).  | 1                 |
| Organizer / Participation in Outside Events (For I Year only) / Consolation Prize or Certification of Appreciation from Outside Events from Affiliated Colleges. | 2                 |
| Winner- Intramurals (1 Prize only) / Winner in Events conducted by Affiliated Colleges (For Every 2 Events).   | 3                 |
| Participation / Runner-up in Universities of TN.   | 4                 |
| Winner in Events conducted by Universities of TN / Participation in Colleges Outside TN.   | 5                 |
| Winner in Colleges Outside TN / Participation in National Level Institutes (NIT / IIT / IIIT).   | 6                 |
| Winner in Colleges Outside TN / Participation in National Level Institutes (NIT only).   | 7                 |
| Winner in Colleges Outside TN / Participation in National Level Institutes (IIT / IIIT only).  | 8                 |
| Participation in Team Events in National Level Institutes (IIT / IIIT).  | 9                 |
| Winner in Team Events in National Level Institutes (IIT / IIIT).   | 10                |

Non-technical events such as music, painting, drama, etc., which will not only keep them away from device addictions but also help in developing a lot of networks and connectivity with faculty and students of other institutions. This helps them to hone their social and interpersonal skills.

### 3.8 Indicator 8: Industry Interaction and Involvement

**Table 7 : Participation In Non-technical Events**

| Descriptor  | Score (in points) |
|---|-------------------|
| Organizing committee Member.  | 1                 |
| Participation inside the institution.   | 2                 |
| Active Participation or Organizer in the Institution/ Participation in outside events.              | 3                 |
| Winner- Intramurals/ / Certificate of appreciation from outside events.                             | 4                 |
| Winner in Events conducted by Affiliated Colleges.  | 5                 |
| Winner in Events conducted by Universities of TN / Participation in Events organized by Industries. | 6                 |
| Winner in Events conducted by National Level Institute / Winner in Events organized by Industries.  | 7                 |
| Multiple prize winners in the same program.   | 8                 |
| Winners in team events at State level Institutions.   | 9                 |
| Winners in team events at National level Institutions.  | 10                |

This is supposed to be one of the major indicators that helps the students understand the work culture of industries and helps them fetch a core job in their field. This indicator not only helps students to attain the affective domain attributes but also cognitive and psychomotor domain attributes, thus developing a student as a whole person. It also helps students to apply their theoretical knowledge to solve problems in society.

### 3.9 Indicator 9: Project contests

**Table 8 : Industry Interaction And Involvement**

| Descriptor  | Score (in points) |
|---|-------------------|
| Membership in trade bodies.   | 1                 |
| Organizing Industrial Visits * / Internship for one week (for II Year Students only) / Participation in IDP activities. | 2                 |
| Internship – SME sector for less than 1 month (> 1 week).   | 3                 |
| Internship – SME sector for 1 month and above.  | 4                 |
| Participation in consultancy activities.  | 5                 |
| Participation in NGO for Societal Projects / Socially Significant Projects.   | 6                 |

|  |    |
|--|----|
| Internship in MNCs / Internship in SME sector with stipend.  | 7  |
| Internship in MNC with stipend / Paid Internship and Sponsored project in SME*   | 8  |
| Paid Internship and Sponsored project abroad or MNC.   | 9  |
| Certificate of Appreciation or Letter of Appointment from MNC or Abroad / Successful Completion of Socially Significant Project (authorized by competent authority). | 10 |

A healthy competition develops a healthy mind. By participating in project contests, students go with one project idea but come back with many such ideas as they witness many other projects in the contest. The rubrics for the students' participation in project contests are given in Table 9.

### 3.10: Indicator 10: Patents /IPR

**Table 9 : Project Contests**

| Descriptor  | Score (in points) |
|---|-------------------|
| Best Mini-Project (in Lab).   | 1                 |
| Participation in Intra-collegiate competitions -Project Design Category.  | 2                 |
| Prize won in Intra -collegiate competitions -Project Design Category.   | 3                 |
| Participation in inter -collegiate competitions under Project Design Category / Secured Funds for Student Projects (TNSCST, Villgro, etc).                              | 4                 |
| Won prize in inter -collegiate competitions under Project Design Category / Participation in inter-collegiate competitions at National Level (other than NIT/IIT/IIIT). | 5                 |
| Won prizes in inter -collegiate competitions at National Level / Secured funds for projects from National Agencies.   | 6                 |
| Participation in International Design Competition.  | 7                 |
| Prize won in International Design Competition.  | 8                 |
| Participation in International Design Competition related to Environmental Protection / New Designs / New Products at the International level.                          | 9                 |
| Prize won for projects related to Environmental Protection / New Designs / New Products at the International Level.   | 10                |

This indicator takes the students' research skills to the next level. Through this indicator, students are made aware of a new arena which is patents/IPR. The rubrics for indicator 10 are given in Table 10. This indicator helps students attain all 12 POs and helps in developing a complete person.

### 3.11. Indicator 11: Image building

**Table 10 : Patents/ipr**

| Descriptor  | Score (in points) |
|---|-------------------|
| Exhibiting a Prototype & Preparation of Application for IPR   | 1                 |
| Application submitted for National Patent.  | 2                 |
| Application submitted for International Patent.   | 3                 |
| Conducting IPR Awareness Programme to Other Students / Publication in The Patent Journal.                         | 4                 |
| Securing a Valid Indian Patent (Multiple Inventors).  | 5                 |
| Successful completion of Examination / Queries.   | 6                 |
| Securing a Valid Indian Patent (Single Inventors)   | 7                 |
| Successful completion of Examination / Queries for International Patent or Securing a Valid International Patent. | 8                 |
| Commercialization of Patents (Outright Purchase).   | 9                 |
| Getting Finance from Venture Capitals for Commercialization.  | 10                |

The disciple of an individual determines the disciple of a society. Discipline creates a peaceful and respectful life. This is a means of measuring the Program Outcome such as Ethics. The detailed rubrics for this indicator are given in Table 11.

### 3.12 Indicator 12: Learning Additional Courses

NEP 2020 emphasizes the importance of multidisciplinary knowledge to students. This indicator has been designed to encourage students to acquire multidisciplinary knowledge and skills. The

**Table 11 : Image Building**

| Descriptor   | Score (in points) |
|--|-------------------|
| No disciplinary action by the Institute  | 1                 |
| Best Student Award (for 2 consecutive years).  | 2                 |
| Participation in Institution Promotional Campaigns.  | 3                 |
| Member of Overall Championship Team in National level events.                                  | 4                 |
| Publishing Scientific / Technical Articles in Daily News.                                      | 5                 |
| Appearing in the Daily News.   | 6                 |
| Representing the organization in National Level Meets.   | 7                 |
| Interviewed by Local TV Channels / Local Magazines.  | 8                 |
| Appearing in the National Level Magazines / Representing the institute in International Meets. | 9                 |
| Interviewed by National TV Channels / Contribution to Wikipedia / TED.                         | 10                |

rubrics to measure this indicator on a scale of 10 have been indicated in Table 12.

### 3.13 Indicator 13: R&D Activities/Scholarly Enquiries

**Table 12 : Learning Additional Courses**

| Descriptor   | Score (in points) |
|--|-------------------|
| Completing other Language / Successful Completion of Certificate course / Value Added Course / Workshop.                               | 1                 |
| Completion of Open-elective* / Attending classes related to GATE / CAT.  | 2                 |
| Securing "B" Grade in BEC / High Score in Campus Connect etc. (Top 10% only) / Member BoS and Contribution for Curriculum Development. | 3                 |
| Securing "A" Grade in BEC / Securing a 75% score (Grade) in IELTS.   | 4                 |
| Successful Completion of online courses from MOOC (For every 2 Courses) / Pass in Advanced BEC Course.                                 | 5                 |
| Successful Completion of Diploma Course related to Profession.   | 6                 |
| Securing more than 80% score in GRE / GMAT or Valid GATE Score with Rank / Valid CAT Score.  | 7                 |
| Participation in National Level Sponsored Training Program.  | 8                 |
| Securing more than 90% score in GRE / GMAT or GATE Score of more than 90 percentile / CAT Score of more than 95 Percentile.            | 9                 |
| Top 10% in GRE / GMAT or First Rank in GATE / CAT Score > 98 Percentile.   | 10                |

The ultimate aim of educating an individual is to enable him/her to think and create solutions to the existing problems in society. The best way to develop this culture among the students is to encourage them to get involved in research and development activities

**Table 13 : R&D Activities/scholarly Enquiries**

| Descriptor  | Score (in points) |
|---|-------------------|
| Analyzing Natural Phenomena and Demonstration of Prototypes / Interaction with Premier Institutions in India* / Undertaking Inter-disciplinary Mini projects. | 1                 |
| Securing Unpaid Internship from IISc / IITs / IIIT / IISER/ Interaction with Premier Institutions Abroad.   | 2                 |
| Securing Summer Fellowship / Paid Internship from IISc / IITs and Foreign Universities for RESEARCH / Securing Research Award from Funding Agency.            | 3                 |
| Developing Infrastructure Facilities for Research at the institute (Tools / Software).  | 4                 |
| Joint Journal Publications with IIT / IIITs / IISER and Foreign Universities* / Securing Funded Project for Upliftment of Common People (SSPs).               | 5                 |
| Implementation of Solutions Provided to Industry Defined Problems with Financial Gain.  | 6                 |
| Direct Admission to Ph.D. in Foreign Universities without financial assistantship.  | 7                 |
| Publishing a Research Monograph by Reputed Publishers.  | 8                 |
| Acceptance of Solution given to SSP by State / Central Government.  | 9                 |
| Direct Admission to Ph.D. with Complete Financial Assistantship in Top 25 Universities as listed in QS - WUR / THE Ranking.                                   | 10                |

right from their college days. A detailed rubric to measure this indicator is given in Table 13.

### 3.14 Indicator 14: Placement, Higher Studies, and Entrepreneurship

After completion of a degree, students move in three directions they either get placed or do higher studies, or become entrepreneurs. This indicator has been designed to measure the same based on the outcome. A detailed rubric for the same has been provided in Table 14.

## 4. Mapping Of 14 Indicators With Ga/pos

**Table 14 : Placement, Higher Studies And Entrepreneurship**

| Descriptor   | Score (in points) |
|--|-------------------|
| On campus Placement in any discipline (Salary up to Rs 3 Lakh Per Annum).  | 1                 |
| On campus Placement in Core Company (Salary more than Rs 3 Lakh / Annum) / Family Business.  | 2                 |
| Placement in Core Company (Salary Rs 3 - 8 Lakh / Annum).  | 3                 |
| Job Secured in Government Services* / Dual Placement (On-campus only) / Placement with Salary more than Rs 8 Lakhs per Annum.  | 4                 |
| Securing a job in Central Public Sector Undertakings /Interview Attended in NITs.  | 5                 |
| Employment in Central Government Research Laboratories / Placement in Indian MNCs (Salary more than Rs 12 Lakh PA) / Interview Attended in IITs / IIMs.  | 6                 |
| Overseas Placement / Admission secured in foreign Universities without Assistantship*  | 7                 |
| Admission Secured in Foreign Universities with Partial Assistantship / Multiple Placements (2 on-campus placements).   | 8                 |
| Placement in Fortune 500 Companies / Admission Secured in Foreign Universities with 100% Assistantship for PG / Placement in Other Companies with a Salary of more than Rs 12 Lakhs per Annum. | 9                 |
| Entrepreneur (on his/her own and not inherited from parents).  | 10                |

The major purpose of designing these 14 indicators is to pave the way for the students to attain the Graduate Attributes and thereby the Program Outcomes. The mapping of these 14 indicators with the 12 graduate attributes has been depicted in Fig. 1.

From the figure, it is evident that all the 12 attributes can be attained by encouraging students to participate in all these various activities thereby



**Fig. 1 : Mapping of Graduate Attributes with Indicators.**

developing them to become personalities with not only engineering knowledge but all the necessary life skills to face the ever-changing world. Also, a student participating in Clubs can be considered equivalent to another student's participation in carrying out R&D activities of the department hence a weightage has been fixed for each indicator based on the effort put by the student in achieving the same.

For example, in Indicator 1 if a student joins a club or does any task related to the club, he is given a weightage of 2 whereas if the same student participates in R&D activities of the department which is in Indicator 13 he is given a weightage of 6. Hence weightage varies for all 14 indicators. If a student scores a maximum score of 10 in Indicator 3 he gets a total score of  $10 \times 3$  (weightage) = 30. But if a student scores 10 in indicator 13 he gets a score of  $10 \times 6 = 60$ , because the weightage of indicator 13 is 6. The grade points obtained can be used to classify the students into different graduate attribute levels. The details of the weightage for the indicators is shown in Table 15.

**Table 15 : Mapping Of Indicators With Weightage**

| <i>Indicators</i>                               | <i>Weightage</i>                        |
|---|---|
| <i>Clubs/NSS/NCC</i>                            | Clubs - 2; NSS - 3; NCC - 4             |
| <i>Sports (Games/Athlete)</i>                   | 3                                       |
| <i>Responsibilities</i>                         | 3                                       |
| <i>Students' Symposia</i>                       | 3                                       |
| <i>Publication</i>                              | 4                                       |
| <i>Technical Events</i>                         | 4                                       |
| <i>Non-Technical Events</i>                     | 3                                       |
| <i>Industry Interaction</i>                     | 4                                       |
| <i>Project Contest</i>                          | 4                                       |
| <i>IPR/Patent</i>                               | 5                                       |
| <i>Image Building</i>                           | 6                                       |
| <i>Courses / Value Addition</i>                 | 5                                       |
| <i>R &amp; D</i>                                | 6                                       |
| <i>Placement / Higher Studies/ Entrepreneur</i> | Placement - 6 / HS,<br>Entrepreneur - 7 |

## 5. Conclusion

By incorporating 14-point indicators, universities can accurately evaluate students' performance in both academic knowledge and essential life skills. This comprehensive assessment approach allows institutions to fully embrace the concept of "Graduate Attribute." In the near future, students may receive report cards that not only show their academic achievements but also their proficiency in various life skills. This collaborative initiative significantly enhances our understanding of holistic education in higher education. It underscores the interconnectedness of intellectual, emotional, social, and physical aspects of learning. Whole person education aims to create learning experiences that empower individuals, enhance self-understanding, foster compassion, develop ethical thinking, and improve communication abilities. While implementing whole-person education presents obstacles, it requires a comprehensive approach that focuses on students, incorporates diverse learning methods, and creates supportive learning environments. Ongoing research is crucial to identify effective teaching methods and assess the long-term benefits of whole person education on student outcomes.

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