Goal Setting and Faculty Development in an Indian Engineering College

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Introduction

The paper presents our experience of conducting a goal setting workshop for faculty members to help them discover their professional capabilities and interests, their institution’s aspirations, and formulate long term goals that will optimally benefit them and their institution. Faculty members are the most critical resources of educational institutes and ensuring their development and contribution to the institution building activities is the most important responsibility of administrators. Early efforts of faculty development were aimed at specific disciplinary expertise and instructional skills [1-5]. However, the development in core engineering and instructional skills is a narrow perspective of professional development and cannot fulfill the needs of today’s faculty and institutions. Camblin and Steger [6] have observed that the faculty development must address issues such as vitality and renewal of faculty members [7], strengthening relationships among colleagues [8], supporting stated institutional missions [9] and dealing with both the faculty member’s and institution’s “capacity to survive” [10]. We argue that educational institutions must develop general leadership and administration skills of the deserving faculty members by leveraging career and motivation management practices established by organizational behavior researchers. Greenhaus et al. examine the conditions under which career goal setting contributes to effective career management [11]. Behar-Horenstein et al.[12] assessed faculty needs at a dentistry college and found 74% to 92% participants rating low their knowledge in acquiring leadership skills and 45% participants rating poor or fair mentoring, which includes goal setting. Sorofman et al.[13] in their report on recommendations on improving quality of pharmacy faculty’s work life include goal setting programs. We have not come across any such research with respect to engineering faculty and posit that the research with respect to faculty of other professional colleges can be applied to engineering faculty. Noe [14] believes that the career management process involves exploring professional domain, developing goals, and formulating strategies to reach the goals.

Towards that, this paper describes a goal setting workshop that the first-author conducted at a rural but top 100 Indian engineering college. Forty senior faculty members’ self-allocated goals based on their self-assessment and organizational aspirations and analyzed them. The major contribution of the paper is in describing the design of a successful workshop, which can help other fellow colleagues in conducting similar workshops. The next sections discuss the importance of goals, the design and the results of the workshop. The paper ends with concluding remarks.

Importance of goals

The goal can be defined as what one wants to achieve in one’s professional career and plays a vital role in one’s motivation level and the resultant performance. Elliott and Dweck [15] have referred goals as the central determinants of achievement patterns. Locke and Latham emphasize that the positive effects of goal setting are very reliable. They argue that failures to replicate the positive effects are usually due to errors such as not using correct performance measures, not
providing regular constructive feedback, and not ensuring competencies required for the allocated goals [16].

Matusovich et al. [17] discuss several motivation theories that recognize that individuals’ actions are shaped by their beliefs, values, and goals. Two theories, namely expectancy value theory and achievement motivation theory, are used widely in the education domain. Expectancy Value Theory (EVT) posits expectancy of success and value beliefs as central in individuals’ engagement in activities [18]. Achievement motivation theorists attempt to explain individuals’ choices of achievement tasks, vigor and persistence with, and the resultant performance in them in achievement situations [18, 19]. In that context, achievement goal is one of the most commonly used constructs. Elliot and McGregor have defined it as the purpose of the competence relevant behavior [20]. The achievement goal is supposed to have four elements – mastery approach, performance approach, mastery avoidance, and performance avoidance [20]. This paper uses the mastery approach goal that is absolute and positive. A mastery goal is aimed at you becoming a master at something and not becoming a top performer based on some extrinsic measures. So instead of trying to get an “A” in a course on innovation, you innovate in real life and add value to appropriate stakeholders. This ensures that your satisfaction or self-worth does not depend on external indicators, which may be beyond your control.

Locke and Latham have evidences of goals increasing performances in more than 100 different tasks involving more than 40,000 participants in eight countries while working in laboratory, simulation, and field settings [16]. Waychal [21] has provided empirical evidence of statistically significant positive correlation between the clarity of goal and the performance of faculty members establishing the criticality of setting professional goals.

**Workshop Design**

The workshop objective was to help faculty members understand themselves, their institution, and formulate long term goals that will optimally benefit the institution and individual faculty members. The authors decided that workshop outcomes should include participants being able to know more about their capabilities and interests, to explain the importance and dynamics of goal setting, to derive their goals to optimize institutional and individual growth, and to realize the goals by arriving at a set of executable projects. The individual faculty members already had appropriate teaching and research goals and the workshop aimed at institutional building and faculty development by undertaking appropriate goals.

The first author learnt the aspirations, the problems, and the goal setting and monitoring processes of the institution. The problems included the lack of sincerity of the faculty in working towards the goals despite proper allocation and inclusion of the goal performance in the KRA (key result areas). Table 1 lists the aspirations i.e., institutional goals. They include student development for various pathways, ensuring better intake, and using ICT (Information Communication Technologies) for core and administrative processes. They also cover supporting aspirations such as increasing research, consultancy, and industry interactions; and meeting accreditation requirements. These goals were reinterpreted as 12 sub-goals such as dividing student development for entrepreneurship, higher education and employment pathways; and ensuring better intake into domestic and international domains.
Table 1: Aspirations of the institution

To have the best domestic and international students.
To ensure effective usage of ICT (Information communication and technology) for administrative, and learning and teaching activities.
Comprehensive student development for higher education in India and abroad, entrepreneurship, and employment in various types of enterprises.
Strengthening of industry institute interaction
Implementation of OBE (Outcome based education)
Accreditation of programs
Strengthening of 3Ps (Publish, Patent, Projects) through research and consultancy

The first author then designed the workshop with the following broad elements: self-assessment using a variety of techniques, fundamentals of goal setting, understanding of and alignment with the institutional goals, analysis of their goals resulting in executable projects, and their discussions with the full cohort. The design is illustrated in figure 1 and discussed in the forthcoming paragraphs.

Figure 1: Workshop Design

1. Pre-workshop: Watch movie “Lakshya”, and assess your strengths and matching careers with the PLOTI instrument.
2. Understand the essence of meditation and meditate; identify what you would like to do for sheer joy.
3. Understand the challenges in engineering, and educating engineers.
4. Reflect on your strengths and liking, and validate them with your peers.
5. Fundamentals of Goal Setting
6. Understand organizational goals and benefits of teaming to scale them
7. Self allocations of the goals based on the assessments, team formation, and goal analysis
8. Team presentations interspersed with implementation challenges. Workshop-end evaluation by the participants.
9. Monthly review of realization of goals. Follow-up evaluation by the participants of the workshop.
the criticality of goals in one’s professional life, which conditions individuals to fill in the goal questionnaire. Turregano says that movies, like case studies, offer real-life portrayals of examples of crisis; which influences viewers’ desire to emulate similar behavior [22]. Champoux believes that the contemporary educators and trainers are using movies due to visual portrayals of life that can be entertaining, memorable, and thought-provoking. Further, he adds, that movies can trigger discussion and counterbalance traditional teaching due to a unique effect of displacement - the effect that allows the viewer to be emotionally involved in a situation, and yet maintain distance to be objective [23]. The participants also assessed themselves using an instrument from PLOTR (http://www.plotr.co.uk/), a UK based, government-supported, and industry-led institution that identifies strengths of individuals and corresponding career options.

2. In the opening session, the workshop faculty emphasized the importance of meditation in education and administered a 20-minute meditation session. Stueckemann [24] states that meditation increases concentration, attention and improves goal-directed action. Miller [25] affirms that meditation enhances a critical first person focus. The meditation session helped participants to calm their minds. In that calm and focused state of mind, they were asked to think of the activities that they would undertake, if they do not have to work to earn livelihood i.e. for sheer joy.

3. The workshop faculty then explained the engineering education scenario by discussing the challenges at the global [26] and national levels [27], and the critical responsibility that today’s engineering educators have to develop workforce to tackle the challenges. The workshop faculty encouraged them to think beyond traditional teaching and research responsibilities and undertake innovative initiatives to develop engineers who can fulfill the requirements of the 21st century [28]

4. After a break, the participants did another self-assessment exercise. The participants identified professional activities that they were best at and activities at which they excelled. The lists were peer-reviewed and validated. All these self-assessment measures brought forth capabilities and interests of individual faculty members. Appendix 2 provides the self-assessment form.

5. Then the fundamentals of goal-setting were discussed [29, 30]. The workshop faculty highlighted that the goals should be SMART (Specific, Measurable, Attainable, Relevant and, Timely) and ensured their correct understanding of the SMARTness by asking them to comment on some sample goals.

6. The workshop faculty then presented the institutional goals decided by the college administration and impressed upon the participants the need of teaming to tackle them.

7. The participants chose a goal based on their self-assessments and teamed up with the faculty members who had chosen the same goal. The recommended team sizes were of two to four faculty members. As discussed earlier, 12 sub goals were developed from the seven goals. All (twelve) goals, except one, were chosen by teams of 2-4 faculty members and there was no contention over any goals. The groups analyzed their goals using the force-field analysis
technique [31], which resulted in concrete projects to realize their goals. Appendix 3 presents a sample analysis.

8. The participants presented analysis of their goals to the entire cohort. To avoid monotony, the workshop faculty interspersed group presentations with implementation (diffusion) challenges and ways to tackle them [32]. On the following day, the participants completed an optional workshop-end evaluation that asked them to list three things that they liked and three things that they disliked about the workshop, and provide overall rating using Reichheld’s net promoter concept.

9. The college administration invited the first author to regularly review the identified projects to ensure their success. After a couple of reviews, a follow-up evaluation was carried out, wherein participants listed two most important benefits and two most important improvement areas of the workshop.

Result

Ayer [33] has suggested formative, summative and follow-up evaluations for any program. The authors evaluated the workshop using those three methods and found the following results.

Formative evaluation

The authors did not carry out formal formative evaluations during the workshop, however, sought informal feedback from the participants during the breaks. The workshop faculty also interacted with each group during the goal analysis session.

Summative evaluation

The third author, a senior faculty at the institute, solicited feedback on the day after completion of the workshop. The workshop faculty received responses from 25 of 40 participants and analyzed them (table 1).

The participants liked the goal setting process – that included assessing capabilities and interests of the individual through a variety of methods, explaining the institutional goals, self-allocating those goals, and analyzing them in teams to identify projects. Eight individuals specifically mentioned the identification of projects as a benefit. The presentation material was liked by eight individuals – most of them liked audio visual clips. Seven participants liked meditation and seven liked the delivery style of the workshop faculty. Four participants liked opportunities to make presentations on their goal realization plans to other groups and four participants liked interactive nature of the workshop. Some of them referred to increased engagement because of the interactive nature. Four participants liked the way workshop faculty managed his presentations. That mainly included time management and question management. Two participants liked the discussion on Indian engineering education scenario. The other factors included ‘the workshop brought out the need of being grateful’, ‘meticulous planning for the workshop’, ‘pre-workshop activities’, ‘focused execution’, and ‘innovativeness of the workshop’. The participants did not suggest any improvement areas. The authors sought overall feedback based on Reichheld’s net promoter score concept [34] by using the Likert scale. The
average turned out to be 4.1/5; the 4 was ‘recommendation’ and the 5 was ‘proactive recommendation’ to other colleagues.

Table 1: Analysis of the workshop end evaluation

<table>
<thead>
<tr>
<th>What they liked</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal setting</td>
<td>11</td>
</tr>
<tr>
<td>Workshop design – action plan</td>
<td>8</td>
</tr>
<tr>
<td>Presentation – audio visuals, material</td>
<td>8</td>
</tr>
<tr>
<td>Workshop design – meditation</td>
<td>7</td>
</tr>
<tr>
<td>Presentation – delivery</td>
<td>7</td>
</tr>
<tr>
<td>Workshop design – group presentation</td>
<td>4</td>
</tr>
<tr>
<td>Workshop design – engaging / interactive</td>
<td>4</td>
</tr>
<tr>
<td>Workshop design – others (importance of being grateful, meticulous, pre-workshop activities, focused, innovative)</td>
<td>4</td>
</tr>
<tr>
<td>Presentation – management</td>
<td>4</td>
</tr>
<tr>
<td>Workshop design – engineering education scenario</td>
<td>2</td>
</tr>
</tbody>
</table>

Follow-up evaluation

After the second monthly progress review, the participants were asked to list two benefits and two improvement areas of the workshop. All 32 participants, who attended the review session, responded. The authors did not consider one response due to the lack of clarity and analyzed remaining 31 responses (table 2). Like the summative feedback, participants did not suggest any improvement areas.

Table 2: Analysis of the follow-up evaluation

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal setting process</td>
<td>18</td>
</tr>
<tr>
<td>Goal realization plans</td>
<td>11</td>
</tr>
<tr>
<td>Team work</td>
<td>5</td>
</tr>
<tr>
<td>Others (how to excel, innovative way of thinking, solving problems, proposed review system, meditation)</td>
<td>5</td>
</tr>
<tr>
<td>Specific suggestions towards the participants’ goals</td>
<td>3</td>
</tr>
<tr>
<td>Clarity of institutional problems</td>
<td>2</td>
</tr>
<tr>
<td>Individual assessment</td>
<td>2</td>
</tr>
</tbody>
</table>

The participants viewed the goal setting process as the strongest benefit. Some participants elaborated with statements such as, ‘scientific approach towards goal setting’, ‘I could
understand the systematic way to achieve any goal in professional life’, and ‘this should help me set goals at departmental level’.

‘Goal realization plans’ had the second highest frequency in the feedback. Some participants elaborated with statements such as ‘focus areas were identified’ and ‘timeframes were defined’.

The workshop included formation of teams and a few team exercises. The participants did benefit from them and stated ‘group working culture’ and ‘role of team members in finalizing goals’, which are a part of the third benefit - ‘teamwork’.

Some participants listed other benefits such as ‘key points in addressing and marching towards excellence’, ‘innovative ways of thinking’, ‘how to face and solve problems systematically’, and meditation. ‘The suggestions / solutions that the workshop faculty provided for their specific goals’, ‘clarity of the institutional problems’, and ‘self-assessments’ were benefits identified by two participants each.

Reliability and Validity

Reliable and valid study connotes the absence of bias and higher truthfulness. For qualitative study, they are conceptualized as trustworthiness, rigor, and quality [35]. Lincoln and Guba [36] believe that for qualitative studies, validity implies reliability and suggest demonstration of only validity in those experiments. Creswell and Miller [37] have observed qualitative researchers employing triangulation, member checking, peer reviews, thick description and external audits to demonstrate validity. They have defined triangulation - a widely used measure in qualitative studies in this context - as a validity procedure where one searches for convergence among multiple and different sources of information. The authors searched for and found convergence between the workshop-end and the follow-up evaluations, which had gap of two months, indicating validity of the data.

Concluding remarks

The faculty members remain the most critical element for the success of any academic institution. The institutional administrators, therefore, must pay attention to their holistic development. Faculty development in core engineering areas is receiving sufficient attention and that in instructional areas is receiving some attention. However, the development of leadership and administration skills, and career management is receiving little or no attention. Toward that end, the administration must facilitate setting appropriate goals and catalyzing their realization.

The authors did that by designing and delivering a goal setting workshop at a leading engineering Indian college to set institution building goals for their senior faculty members. The individuals already had appropriate teaching and research goals. Going by the workshop-end and the follow-up feedback, the workshop was successful. Participants have given positive feedback at the end as well as two months after the workshop and are progressing well on realization of their goals. The overall summative feedback based on Reichheld’s net promoter score concept [34] by using the Likert scale was 4.1/5; the 4 was ‘recommendation’ and the 5 was ‘proactive recommendation’ to other colleagues. The participants did not suggest any improvement areas either in summative or in follow-up feedbacks. The participants liked the goal setting process and mapping of goals to specific projects to facilitate realization of the goals. The workshop end feedback focused more on the techniques and practices followed in the workshop and the follow-
up feedback focused more on the absolute benefits. This brings out the value of the follow-up feedback.

The fact that the workshop had resulted in specific executable projects seems to have increased the workshop benefits. The workshop, though, did not alter the goals. All participants chose the goals that were closer to their earlier goals, indicating the correctness of allocation by the administrator. It is also possible that they already had started working on the goals and did not want to lose that advantage and restart with another goal.

More iterations of the workshop in similar and diverse institutions are necessary to validate the benefits such as participants choosing and analyzing appropriate institutional goals, and successfully realizing them. While the follow-up feedback after two months of the workshop has also been positive and the monthly reviews indicate good progress towards the goals; the real success of the workshop is in the ultimate realization of the goals, which will require some more time. However, the workshop design and execution offers sufficient learning to fellow colleagues in carrying out similar workshops in other institutions, which has been an articulated need of faculty members of professional colleges [12, 13].

Acknowledgement

We thank all the faculty members, who participated in the workshop, and the institute administrators, who supporting the workshops and the follow-up sessions. We also thank the division program chair, Prof Sanger; and anonymous reviewers for their valuable comments.

References


Kakodkar, e.a., *Technology Vision 2035*. 2015, Technology Information, Forecasting and Assessment Council (TIFAC).


## Appendix 1: Goal Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
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<tbody>
<tr>
<td>Enter your Full Name</td>
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<tr>
<td>Enter your Department</td>
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</tr>
<tr>
<td>1. How will you define excellence?</td>
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<tr>
<td>2. How significant it is to be excellent?</td>
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<tr>
<td>3. Why do we resist change?</td>
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<td>4. Why goal is important?</td>
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<td>5. Which goals are even worth dying for?</td>
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<tr>
<td>6. How peers influence goal selection and efforts towards meeting them?</td>
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<tr>
<td>7. What kind of peer group you would like to have?</td>
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<tr>
<td>8. If you want to win - what is your goal and timeline for that?</td>
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<td>9. What would you like to do for that from today?</td>
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<tr>
<td>10. How can you make your goal - team goal?</td>
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<tr>
<td>11. If you were in your supervisor’s position (HOD (head of the department or department chair) / director (head of the institute)), how will you build team to achieve difficult tasks?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2 – Self-assessment

Part 1: PLOTTR

A. Assessed Role

B. Assessed skills

Part 2: Diving Deep

What would you like to do, if you do not have to work for your livelihood / survival?

Part 3A: Reflection

<table>
<thead>
<tr>
<th>I am good at the following in the order of priority</th>
<th>I enjoy the following in the order of priority</th>
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Goal Analysis Framework

This framework consists of separate steps each of which contains a complete and separate idea, question, or instruction. Be sure that you understand and complete each step before going on to the next one.

1. Identify the goal you wish to work on and provide background of the goal area – why it’s important for you.

   Industry Institute Interaction

   Enough opportunities are available in industries.
   But students are not fulfilling industry expectations

2. Most goal statements can be rephrased so that they describe two things: the situation as it is now (Current State) and the situation as you would like it to be (Expected End State – aspirational targets)

   Current State (Quantify to the extent possible)-
   - only 25% Engg. are employable.
   - Lack of gaps between Industry expertise & Students Skills
   - Less participation of Industry person/experts in academic activities

   Desired State (Quantify to the extent possible)-
   - Participation of Industry Experts should be Increase
   - Curriculum formulation should as per Industry requirement
   - Enhancing Employability of Engineer to 60%

   Expected timelines
   0. Had 9 Year
   0. A year,
   0. A year.

   Why I am choosing the goal
   - Enhance student placement.
   - Improve faculty community.
   - Opportunity to work on live problems.
   - Improvement in consultancy, Research O/P.
3. Most goals can be understood in terms of the forces that push toward and against improvement - in other words, the helping forces and opposing forces. It is useful to analyze your goal by making lists of the helping and opposing forces affecting the situation. Think about these now, and list them. Be sure to list as many as you can, not worrying at this point about how important each one is.
(Use additional paper if you need to.)

<table>
<thead>
<tr>
<th>Helping Forces</th>
<th>Opposing Forces</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Valide Alumni base</td>
<td>• Less R&amp;D allocated in Local Industry</td>
</tr>
<tr>
<td>• Easy access to small scale Industry</td>
<td>• Resistance from Industry</td>
</tr>
<tr>
<td>• Financial support from Management</td>
<td>• Time unavailable to industry</td>
</tr>
<tr>
<td>• Goodly faculty strength</td>
<td></td>
</tr>
</tbody>
</table>

4. Review the two lists. Underline those forces that seem to be the most important right now, and that you think you might be able to influence constructively. Depending on the goal, there may be one specific force that stands out, or there may be two or three helping forces and two or three opposing forces that are particularly important.

5. Now, for each opposing force you have underlined list some possible courses of action that you might be able to plan and carry out in order to reduce the effect of the force or eliminate it completely. Brainstorm. List as many action steps as possible, without worrying about how effective or practical they would be. You will later have a chance to decide which are the most appropriate.

   Opposing force A  Resistance from Industries

   Possible action steps to reduce this force:
   • Approach the industry through Alumni
   • Visit of students and faculty to industries
   • Arrange expert lecture, workshops by industrial person

   Opposing force B  Less R&D allocated in local Industries

   Possible action steps to reduce this force:
   • Industry internship for students
   • Demonstrate faculty technical competence to industries
   • Collaborative projects & publications

   Opposing force C  Time availability
Possible action steps to reduce this force

* Arranging webinars through Skype
* Provision for industry visits in Academic calendar
* Flexibility to faculty for industry visits/interactions

6. Now do the same with each helping force you underlined. List all the action steps that come to mind that would increase the effect of each helping force.

Helping force A Wider Alumni base

Possible action steps to increase this force

* Correct maintaining correct database of Alumni
* Regular interactions with Alumni
* Use of Facebook, LinkedIn, & WhatsApp for continued interaction.

Helping force B Good faculty strength

Possible action steps to increase this force

* Preparing brochure of faculty competencies & short & long
* Arranging training program for Industry
* Solving industry problems

Helping force C Financial support from management

Possible action steps to increase this force

* Easy access to small scale industry
* Solving industry problems (student projects)
* Multidisciplinary project

7. You have now listed some action steps that might change the key forces affecting your challenge/situation. Review these possible action steps and underline those that seem promising.
List the steps you have underlined. Then for each action step list the materials, persons, and other resources available to you for carrying out the action.

<table>
<thead>
<tr>
<th>Action Steps</th>
<th>Resources Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Approach to industry through Alumni : Alumni database, Alumni coordinator, faculty, students</td>
<td></td>
</tr>
<tr>
<td>2) Collaborative projects &amp; publications: MOV with industry, materials, Faculty, student</td>
<td></td>
</tr>
<tr>
<td>3) Arranging webinars: MOV with industry, infrastructure</td>
<td></td>
</tr>
</tbody>
</table>

Review the list of action steps and resources and think about how each might fit into a comprehensive plan of action. Take out those items that do not seem to fit into the overall plan, add any new steps and resources that will round out the plan, think about a possible sequence of action, and outline that sequence. This will result in a prioritized list of three top projects/actions you will help you to reach your goal. Describe your rationale of choosing them.

<table>
<thead>
<tr>
<th>Project</th>
<th>Rationale for choosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project -1 Alumni Database</td>
<td>Existing database is not sufficient, more opportunities to strengthen interaction.</td>
</tr>
<tr>
<td>Project -2 Collaborative projects &amp; publication</td>
<td>Availability of competent faculty &amp; provision for project in curriculum.</td>
</tr>
<tr>
<td>Project -3 Arranging webinar</td>
<td>Institute location is remote &amp; technology will be helpful.</td>
</tr>
</tbody>
</table>

Decide measures of success and methods of the measures (both final and intermediate) of your action program.

<table>
<thead>
<tr>
<th>Project</th>
<th>Final Measures of Success</th>
<th>Intermediate measures of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project -1 Alumni database</td>
<td>No. of interactions through Alumni</td>
<td>No. of Alumni responded positively to the first request</td>
</tr>
<tr>
<td>Project -2 Collaborative project &amp; publication</td>
<td>No. of projects, No. of publications</td>
<td>No. of activities initiated.</td>
</tr>
<tr>
<td>Project -3 Arranging webinar</td>
<td>No. of webinars</td>
<td>No. of activities initiated.</td>
</tr>
</tbody>
</table>