

REVIEW ARTICLE

Reward outstanding engineering faculty through the "goal, resources, training, review, and reward" model

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ABSTRACT

In the 21st century, the linkages between engineering institutions and industry have been strengthened. Institutions are suppliers of industry-ready graduates, problem solvers through consultancy services, trainers of employees and executives, and providers of intellectual products. The success of this supply chain lies deeply in the outstanding engineering faculty members. A comprehensive literature survey was conducted on the rewards for exceptional faculty members at global universities. There is a need to recognize well-accomplished faculty members in engineering services to honor their contributions and inspire excellence within the academic and professional community. A strengths, weaknesses, opportunities, and threats (SWOT) analysis and an opportunity analysis were conducted to identify areas that required contributions from a well-accomplished faculty team. A model has been proposed: Goal, resources, training, review, and reward (GRTSRR). The steps for implementing the model have been presented. This model has been piloted through a series of externally funded projects by the Asian Development Bank-assisted project, the United Nations Development Program (UNDP)-assisted project, and the World Bank-assisted project. This model requires evaluation and refinement to meet the specific needs of various institutions.

Keywords: performance needs, reward, "strengths, weaknesses, opportunities, and threats" analysis, opportunity analysis, "goal, resources, training, review, and reward" model

INTRODUCTION


Most outstanding universities in the United States of America (USA), the United Kingdom (UK), and other industrialized countries have benefited from cultivating the best faculty teams and supporting them whenever these faculty members face difficulties in achieving outstanding outcomes. By following these faculty development practices, providing the necessary autonomy, and sharing resources, many rapidly developing Asian countries have also achieved substantial success in building the required human and knowledge capital. Their industries developed more cost-effective products for developed nations,

thereby helping to save the environment from pollution. Yet many countries must focus on these aspects and build their faculty. To sustain this growth, they must identify effective methods for planning faculty development and strategically rewarding outstanding achievers. Even though many universities avail themselves of soft loans from various international development agencies, success can be ensured only after the exceptional faculty teams start contributing to institutional development through advances in research, education, and services. Without well-organized and accomplished teams, there can be no significant revenue generation, a strong reputation, innovative products, or substantial contributions to the

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economy. In the 21st century, industrial development is heavily dependent on graduates possessing the necessary industry-specific attributes.

Research questions

Engineering faculty members must continuously assess the needs of learners, employers, learning and cognition, innovation, and global impact. They need a counsellor, a coach, and a mentor. Further, they need to review their achievements and set further targets. All these need support and scaffolding from the organization. The significant questions considered for this research are presented below: (1) What will happen if the institution does not reward the best-accomplished faculty members? (2) How will you recognize well-accomplished faculty members in engineering services? (3) How will you assess excellence in teaching? (4) How will you assess research contributions? (5) How will you assess the contributions of a faculty member in innovative technology advancements? (6) How will you assess a faculty member's industry collaboration and their impact? (7) How will you assess the acquisition of funds for research and development? (8) How will you assess a faculty member's contribution to professional leadership and service? (9) How will you assess a faculty member's contribution to community engagement and outreach? (10) How will you evaluate a faculty member's contribution to interdisciplinary programs? (11) How will you assess a faculty member's collaborative activities and the recognition received? (12) How will you estimate a faculty member's lifetime contribution to the advancement of engineering?

What will happen if the best-accomplished faculty members are not rewarded?

The rewards could be based on the demands made on the institution. A well-established institution will focus on establishing various advanced engineering programs, specialized branches, interdisciplinary research, and community and industry service. To improve their capability and quality, they typically focus on developing their faculty competencies and reward them to motivate them. Rewarding high-performing faculty members increases achievement motivation among other faculty teams and encourages them to enhance their competencies.

It will create dissatisfaction among faculty members. They will lose intrinsic motivation, which may retard their performance, but many may leave the institute. The other faculty members also get discouraged. The institute will lose its credibility and reputation. The Board of Governors will lose its recognition. The return on input will be minimal. When the performance is very low, the government may not sanction funds. Ultimately, the institute could be closed. To avoid these issues, every

Board of Governors should focus on excellence, made possible by outstanding faculty teams. The return on rewards will be many times greater, and it will enhance research outcomes, education, and the services provided by faculty members.

Status of engineering institutes in the backward states of India: Many engineering institutions in the backward states fail to adequately train their faculty members, recognize and reward high-performing faculty teams, and secure client recognition. They do not modernize their resources and develop a strategic vision for institutional development. Micro, small, and medium enterprises (MSMEs) in these states often depend on autonomous institutes in neighboring states. Ultimately, when student enrollment decreases, these institutes cannot remain viable and may be forced to close.

Recognizing well-accomplished faculty members in engineering services

It is to honor their contributions and inspire excellence within the academic and professional community. Here are the ten most significant reasons for awarding the faculty members based on the desired performance by them: (1) Excellence in teaching. Recognizing outstanding educators who have demonstrated innovative methodologies and facilitated diverse global faculty development programs and learner engagement. (2) Research contributions. Honoring faculty members who made significant contributions to engineering research, published high-impact papers, or secured patents. (3) Innovative and technological advancements. Awarding those who have developed groundbreaking technologies, prototypes, or solutions addressing real-world engineering challenges. (4) Industry collaboration and impact. Acknowledging efforts in bringing academia and industry together through partnerships, consultancy, and applied research. (5) Grants and funding acquisition. Recognizing faculty members who have secured substantial research funding to support the growth of engineering programs. (6) Professional leadership and service. Awarding those who actively contribute to professional organizations, engineering societies, international development agencies, national councils, commissions, university faculty development centres, state higher education councils, national development groups, educational institutions, and national training and development organizations. (7) Community engagement and outreach. Honoring contributions in promoting science, technology, economics, architecture, and management (STEAM), engineering education without borders, mentoring young engineers, or leading international development projects. (8) Interdisciplinary contributions. Recognizing faculty collaborating across disciplines to solve complex problems. (9) International recognition and collaboration. Celebrating faculty members' global

impact through collaboration, invited keynote presentations, or international joint projects. (10) Lifetime achievements and legacy. Acknowledging long-term contributions that have shaped the institution, engineering, and future generations.

LITERATURE SURVEY

A focused survey based on global visibility is presented, drawing on awards given by various well-established universities in advanced countries and regions, such as the USA, Canada, the UK, and Hong Kong (China). Many other countries have recognized their top faculty teams for their significant contributions in the three specified areas of research, teaching, and service, which they have offered to society and industries.

Synthesis is based on the awards granted to the faculty based on their contribution in three areas, namely, research, instructional delivery, and services rendered. This approach can be considered as a guideline for other institutions to emulate good practices that are listed below: (1) Outstanding universities have implemented criteria for recognition that align with educational goals and values, ensuring contributions to students' success, research, and community engagement. (2) Universities also implemented mentorship programs and provided funding for professional development. (3) Universities have their own criteria and processes for nominations and selection. (4) Common practices are annual faculty awards, nominations for national associations, sabbatical for research, and funds for undertaking innovative practices. (5) Rewarding outstanding engineering faculty members can take various forms, such as research funding and teaching opportunities. (6) Priority institutions typically develop criteria-based measures of teaching excellence and community services. (7) They include public acknowledgements and funds for participating in various international conferences. (8) They also ensure that the criteria for awards are clear and transparent. (9) They conduct a comprehensive evaluation of faculty performance. (10) Further, they tailor the recognition to align with the faculty member's specific achievements and contributions to the field. (11) Outstanding engineering faculty members are rewarded through various methods such as teaching awards, research grants, promotional opportunities, public recognition events, and monetary incentives. (12) Universities often have formal award programs that recognize exceptional contributions to engineering education, research, and community service. (13) These initiatives acknowledge individual achievements and inspire others within the academic community. (14) Core competencies are to be developed for creating excellent engineers. (15) Universities are facilitating outstanding engineering faculty members from recruitment to

retirement.

NEED FOR RECOGNIZING WELL-ACCOMPLISHED FACULTY MEMBERS IN ENGINEERING SERVICES TO HONOR THEIR CONTRIBUTIONS AND INSPIRE EXCELLENCE WITHIN THE ACADEMIC AND PROFESSIONAL COMMUNITY

Here are the key reasons for working with them. The performance of the faculty can be evaluated by focusing on the following twelve focus points: (1) Excellence in teaching. Recognizing outstanding educators who have demonstrated innovative teaching methodologies, mentorship, and learner engagement. (2) Research contributions. Honoring faculty members who made significant contributions to engineering research, published high-impact papers, or secured patents. (3) Innovations and technological advancements. Awarding those who have developed groundbreaking technologies, prototypes, or solutions addressing real-world engineering challenges. (4) Industry collaborations and impact. Acknowledging efforts in bringing academics and industry together through partnerships, consultancy, and applied research. (5) Grants and funding acquisition. Recognizing faculty members who have secured substantial research funding, supporting the growth of research in engineering programs. (6) Professional leadership and service. Awarding those who actively contribute to professional organizations, engineering societies, or standard committees. (7) Community engagement and outreach. Adding contributions to promoting STEAM education, mentoring young engineers, or leading community development projects. (8) Interdisciplinary contributions. Recognizing faculty collaborating across disciplines to solve complex engineering problems. (9) International recognition and collaboration. Celebrating faculty members' global impact through collaboration, invited presentations, or international research projects. (10) Lifetime achievements and legacy. Acknowledging long-term contributions that have shaped the institution, engineering, and future generations.

Furthermore, the above performance areas are significantly influenced by the following three areas: Research, teaching, and services. Hence, the strategic plan should focus on three key areas, and funds should be allocated for development.

Key elements of successful recognition programs

Based on the practices of various global universities, ten key elements of the most successful recognition programs are presented below: (1) Clear criteria and goals. The program should have transparent recognition

criteria and clear goals that align with the institutional vision and mission. (2) Consistency. The main thrust should be consistently recognized, and faculty members should feel that their efforts are noticed regularly. (3) Inclusivity. The program should be inclusive, recognizing contributions from all levels and departments within the institutions. (4) Personalization. Tailor the recognitions to the individual's preferences and contributions. Personalized rewards and recognition have a greater impact. (5) Timeliness. recognize faculty promptly after achievements to ensure the recognition is meaningful and relevant. (6) Public acknowledgement. Publicly acknowledging achievements can boost morale and motivate others. This can be done through faculty meetings, newsletters, annual reports, or social media. (7) Variety of rewards. Offer a mix of tangible and intangible rewards, such as cash, medals, nominations for advanced programs, and travel grants to participate in international conferences. (8) Faculty involvement. Encourage peer-to-peer recognition to build a supportive and collaborative workplace culture. (9) Continuous feedback. Regularly gather feedback on the program's effectiveness and adjust as needed to keep it relevant and impactful. (10) Alignment with institute culture. The recognition program should reflect the institute's culture and values, reinforcing what the institution stands for (Table 1).

Integrating these elements can create a recognition program that motivates faculty and fosters a positive, high-performing work environment. Most successful universities have institutionalized these practices, and their outstanding achievements in planning innovative, interdisciplinary graduate and postgraduate programs depend on faculty members' performance. They can improve the return on investment.

Statement of the problem

The needs of fast-growing universities in developing countries need to be assessed to enable appropriate strategic planning. The universities must identify their growth needs and create the necessary goals for planning faculty development, improving institutional resources, developing outstanding faculty teams, training them through various training methods, scaffolding them whenever needed, conducting appreciative inquiries, and rewarding them so that they can continuously be motivated to contribute to the attainment of the vision of the university. This leads to the "goal, resources, training, review, and reward" (GRTSRR) model, which rewards outstanding faculty teams. This paper will serve as a model for further investigation and implementation of a reward system in engineering institutions.

Objectives of this research

The following are the objectives of the research: (1)

Assess the institutional needs for developing the outcome of the institution. (2) Identify resources, infrastructure, faculty members, funds, and opportunities for developing outstanding faculty teams. (3) Planning is needed for faculty development programs to match the planned outcomes. (4) Scaffold the faculty as and when they need. (5) Continuously conduct appreciative inquiries on their achievement and shortcomings. (6) Plan accelerated development programs to transform the faculty members into outstanding teams. (7) Plan an appropriate reward system to retain and motivate the outstanding faculty teams.

Research methodology

This approach is based on an empirical-rational framework, developed from experience. first, a strengths, weaknesses, opportunities, and threats (SWOT) analysis has been performed (Table 2). Second, the identified areas of need are listed in Table 3. The development of the model has been presented in Table 4.

Opportunity analysis

Based on a SWOT analysis, the available opportunities are to be explored. faculty members must undertake appropriate programs to offer solutions to the industry. for successful solutions, faculty members should be rewarded.

These six opportunities have been identified due to the growth in needs driven by globalisation. When disruptive technologies are implemented by various transnational companies in developing countries, there are likely to be numerous opportunities for innovation in engineering institutions. By systematically updating their faculty, these institutes could become deemed universities in engineering.

Identifying the areas needed for the contribution by a well-accomplished faculty team

The following three major areas are to be explored: (1) Research, (2) education, and (3) service. The institutional needs need to be identified based on the strategic planning.

It is essential to analyze the required resources and faculty in line with the strategic plan. Engineering institutes must develop resources and employ qualified faculty members. Furthermore, the faculty needs to be trained, appraised, and provided with the required resources and support staff. In due course, they will achieve success. To retain such a faculty team, one must reward them. This will motivate more faculty members to follow in the footsteps of the achievers. Institutes of national importance and centers of excellence have implemented numerous development areas, and these

Table 1: Survey of awards presented to the outstanding faculty members by various global universities

Institution	Area	Year	References	Award
Northeastern University, USA.	Sustained leadership	2024	Northeastern University, 2024	Outstanding faculty service award to recognize faculty contributions to the institution through exemplary and sustained leadership in engineering
College of Science and Engineering, Princeton University, USA.	Significant revenue through services	2023	Princeton Engineering, 2023	The time and effort faculty members dedicate to the operation and budgeting of their institution are highly appreciated and rewarded
College of Science and Engineering, Minnesota University, USA.	Exceptional performance in all areas	2024	College of Science & Engineering, University of Minnesota, 2024	Exceptional performance and contributions by academic professionals and administrative staff are rewarded
Riccio College of Engineering, University of Massachusetts, Amherst, USA	Excellence in teaching through instructional design and delivery	2024	Riccio College of Engineering, University of Massachusetts Amherst, 2024	The Outstanding Teaching Award recognizes excellence in teaching and honors individual faculty members at each of the university's colleges for their instructional design and delivery
College of Engineering of The University of Georgia, USA	Exceptional contribution in all three areas	2024	College of Engineering, University of Georgia, 2024	Recognizing and rewarding outstanding faculty members for their exceptional work
College of Engineering, Drexel University, USA.	Best performance in all three areas	2025	College of Engineering, Drexel University, 2025	2025 Longview Fellowships, Corleone Faculty Awards, and Grimes Family Awards for the best performance
Penn State Engineering Alumni Society, USA	Outstanding teaching	2023	Penn State University, 2023	Alumni award for exceptional teaching
WWU Alumni Outstanding Faculty Legacy Award	Lasting impact due to excellence in all three areas	2024	The foundation for WWU & Alumni, 2024	The award is presented to the current or retired Western faculty member who has made a lasting impact on their lives
Florida International University	Outstanding contribution to teaching	2024	Florida International University, 2024	Outstanding faculty award
ERG, Hong Kong, China	Research contribution	2012	Wikipedia, 2012	Award for the highest standards of research
Metropolitan State University of Denver, USA	Planned performance in teaching	2024	Metropolitan State University of Denver, 2024	Excellent performance in teaching and learning
North Carolina State University, USA	Performance that leads to leadership development	2024	North Carolina State University, 2024	The reward recognizes emerging academic leaders among the faculty
University of California, Santa Barbara College of Engineering, USA	Outstanding faculty member excelling in all three fields	2020	UC Santa Barbara's College of Engineering, 2020	The reward for the exceptional faculty member
Purdue University's College of Engineering, USA	Merit is due to the best performance	2021	Purdue University, 2021	The reward for wide-ranging merits
University of Waterloo, Canada.	Outstanding performance as prescribed by the institute	2005	University of Waterloo, 2005	The reward for exceptional performance
University of Vermont, USA.	Expertise	2021	The University of Vermont, 2021	The reward is for a faculty member who has demonstrated responsiveness, availability, concern, respect, and a depth of expertise
Arizona State University, USA	Mentoring	2018	Arizona State University, 2018	The reward for an outstanding master's mentor
California State University, Chico, USA	Outstanding contribution	2018	Murphy, 2018	Outstanding faculty were awarded
Carl R. Ice College of Engineering, USA	Excellence in undergraduate teaching	2024	Carl R. Ice College of Engineering, 2024	The engineering award for excellence in undergraduate teaching
University of California, Davis, USA	Outstanding contribution to material science and engineering	2024	University of California Davis, 2024	Outstanding junior faculty award in materials science and engineering
Penn State University, USA	Scholarship in the specified areas	2023	Penn State University, 2023	Faculty scholar modal
College of Engineering, Purdue University, USA	Outstanding performance in teaching and research	2020	College of Engineering, Purdue University, 2020	Excellence awards for creating stunning examples
College of Engineering, Princeton University, USA	Outstanding instructional design and delivery	2025	Princeton Engineering, 2025	Engineering students' recognition for exceptional teaching
The Penn State Engineering Alumni Society, USA	Excellence in all three areas	2023	Penn State Engineering, 2023	Award for exceptional contributions to teaching, research, advising, and service
KSU, USA	Total global contribution in research, service, and instructional delivery	2018	Kennesaw State University, 2018	Rewards to the KSU faculty and staff for their work and commitment to making KSU a world-class university

(To be Continued)

(Continued)

Roever Engineering, USA	Effective teaching and services rendered	2024	Roever Engineering, 2024	Effectiveness in teaching and service
The Petroleum Engineering Department at Texas A&M University at Qatar	Contribution to all specified areas by petroleum engineers	2021	Texas A&M University at Qatar, 2021	Reward for Petroleum Engineering faculty members
University of California, Santa Clause, USA	Excellence is based on peer faculty assessments	2024	UC Santa Cruz, 2025	Reward from peers for excellence
Baylor University, USA	Outstanding contributions in teaching and research	2020	Baylor University, 2020	Baylor magazine award to outstanding faculty for teaching and research
Missouri University of Science and Technology, USA	Contributions to power engineering	2023	Missouri University of Science & Technology, 2023	Grainer outstanding power engineering student awards
College of Engineering, Northeastern University, USA	Outstanding contributions in effective teaching	2023	College of Engineering, Northeastern University, 2023	Martin Easigmann outstanding teaching Award for consistently demonstrating teaching effectiveness in a manner substantially exceeding normal expectations for a faculty member
Provost, North Carolina State University, USA	Outstanding contributions to undergraduate students	2022	Provost, North Carolina State University, 2022	North Carolina State Advising Award to a distinguished undergraduate professor
Hong Kong University of Science and Technology	Excellence in instructional design and delivery	2024	Hong Kong University of Science and Technology, 2024	Award to a faculty member for excellence in the design and delivery of courses and adequate supervision
Virginia's Institutions of Higher Learning, USA	Best contributions to all three areas	2024	Virginia's Institutions of Higher Learning, 2024	Outstanding faculty award
University of California, Davis, College of Engineering, USA	Outstanding contributions to all their areas	2021	University of California, Davis, 2024	Outstanding award to faculty members who have demonstrated excellence in teaching, research, and community services
School of Engineering, Massachusetts Institute of Technology, USA	Distinguished performance	2024	School of Engineering, Massachusetts Institute of Technology, 2024	Award for the distinguished professor
Dexin Hu, Haixin Song	Outstanding contributions to human capital	2025	Hu & Song, 2025	The elements and reform path of core competencies for excellent engineers in China
Yi Liu, Yintai Xiao, Xueming He	Excellent core competencies	2025	Liu <i>et al.</i> , 2025	Core competencies needed for engineers
Thanikachalam Vedhathiri	Facilitating outstanding faculty members and developing them	2024	Vedhathiri, 2024	Facilitating outstanding engineering faculty members in recruitment

ERG, Employee Resource Group; KSU, Kennesaw State University; WWU, Western Washington University; UC, University of California; USA, the United States of America.

institutions have begun to gain a reputation. The outstanding faculty members have also earned Fellowships from various national academies, including the Indian National Academy of Engineering and the Indian National Science Academy.

Rewarding outstanding contributions to knowledge capital: This can take many forms, ranging from formal recognition to financial incentives or opportunities for professional growth. Some institutions might offer awards such as: (1) Research grants and fellowships. Financial support for continued research or advanced study. (2) Publication awards. Recognition for articles, papers published in prestigious journals, or books published through reputable publishers. (3) Innovation awards. Acknowledging breakthroughs and innovative solutions that advance knowledge within a field. (4) Teaching excellence awards. Those who excel in educating and mentoring others. (5) Professional development opportunities. Access to international conferences, bilateral faculty development programs, fellow-

ships, technical working group meetings organized by international development agencies, and nominations to internships offered by global universities for further education. (6) Honorary titles and positions. Such as endowment chairs, distinguished professorships, program executives, dean of faculty development, or special appointments.

Rewarding contributions to knowledge capital not only motivates individuals but also fosters a culture of continuous learning and innovation. Many outstanding faculty members have received internal awards from professional associations, such as the Global Engineering Deans Council (GEDC) and the International Federation of Engineering Education (IFEE).

A MODEL FOR IDENTIFYING OUTCOMES MUST BE BASED ON THE DEVELOPMENT PROCESS

Process of development: Based on the continuous focus

Table 2: SWOT analysis

Category	Analysis details
Strengths of the college/university	Well-developed institution; Gained a reputation over 60 years; Excellent resources; Supportive board of governors; Well-accomplished faculty teams; Developed active linkages with local companies and the government engineering departments; Institutional member of the National Society for Training and Development, Engineering Education, and other professional associations.
Weaknesses of the college/university	Has yet to offer consultancy projects to IDAs; Yet to generate substantial internal revenue through consultancy projects, sponsored research, and development projects; Yet to offer industry-sponsored interdisciplinary postgraduate programs; Lack of trust in the strategic planning.
Opportunities available	Demand for interdisciplinary programs; Demand for consultancy projects under many IDAs; Demand for joint research from local companies; Demand for offering executive development projects; Demand for developing diverse global faculty development programs.
Threats	Many foreign universities establish; Research and Development Centres in the State; Well-accomplished faculty planning to turn over; Companies often fail to offer consultancy projects due to a lack of motivated faculty teams; Students avoid enrolling in this institute; Very low reputation for the services offered by this institute.

SWOT, strengths, weaknesses, opportunities, and threats; IDAs, international development agencies.

Table 3: Opportunity analysis

Opportunity	Supplying human resources	Training the skilled workers	Training the executives	Offering consultancy	Offering solutions to the problems	Offering intellectual products
Process	Through industry-ready graduates	Planning and conducting skill development courses	Planning and offering advanced cognitive programs	Undertaking consultancy projects to solve the problems in design, testing, and manufacturing	Safety, manufacturing, increase in productivity, improvement in quality, long life, problem solving	New products, equipment, quality consumables, spares, new modules, <i>etc.</i>
Product	Planning an outcome-based curriculum and cooperative programs	Training in the operation of modern machines	Offering executive management programs and action research	Assistance Through dissertations, theses, and joint investigations.	Service through linkages and problem-solving	Innovations through advanced research and development.

on the growth of engineering institutes in India since 1970, six key elements have been identified. The strategic vision serves as the foundation for planning industry-specific and interdisciplinary programs, acquiring modern resources, and providing continuous training to faculty members. This support is offered at various stages, with progress and accomplishments reviewed, and the best achievers ultimately rewarded. This model is presented in Table 5.

Steps in implementing the model

The following six steps are proposed in planning and implementing this GRTSRR model.

Step 1: Setting the goal. Faculty members will plan to achieve their performance targets to accomplish the

goal. Typically, to prepare a strategic plan, the institute holds a faculty meeting to introduce various goals for each department. Each faculty, based on its accomplishments and approval, must plan its activities to achieve the specified goal within the fixed period.

Step 2: Creating resources. Without adequate resources, it is impossible to perform effectively. Hence, the institution needs to improve its resources. It is possible to add resources through grants-in-aid, funding from international development agencies, alumni donations, or internal revenue generation.

Step 3: Train the faculty and facilitate them. In addition to education, faculty members are to be trained to enhance their cognitive abilities, motor skills, and attitudes, enabling them to deliver interdisciplinary

Table 4: Needed areas in research and desired outstanding faculty members

Type of the Institute	Needed research areas	Resources	Programs and projects to be planned	Desired outstanding faculty expertise
Community College/ Technician Institute/Polytechnic	Skill Development Global Standards Productivity Multitasking Optimization of Energy Utilization Quality Safe Environment Safety in Working Interdisciplinary Curriculum Instructional Design	Modern tools, Equipment, Workshops, Space, Internet, Infrastructure, Funds, Grants-in-Aid, and the ILO suggested training methods	Industry-specific skill development programs, manufacturing methods, pollution control, and training in Industry 4 process; Getting on-the- job training	Establishing up-to-date skill development programs, quality manufacturing, safe work practices, and continuously updating equipment; Kanban method of training
The Engineering College that offers Undergraduate Programs, Diplomas, and certificate courses	Planning advanced undergraduate programs, continuing education courses, and undertaking sponsored projects; Planning continuing education courses	Linkages with industry, faculty development institutes, up-to-date resources, and funds; Industry- specific courses	Outcome-based curriculum, cooperative programs, on-the-job training, curriculum evaluation, and design	Advances in engineering, Curriculum planning, instructional planning, and capstone projects
Autonomous College offers Interdisciplinary Graduate programs, Dual Programs, and Doctoral Programs	Planning advanced dual programs, offering courses to employees of companies, undertaking sponsored research works, job works, and internal revenue generation	Modern resources, internet facilities, online programs, and dissertations based on the needs of MSMEs	Up-to-date undergraduate and interdisciplinary postgraduate programs, accreditation, and revenue generation using the resources and space	Advanced curriculum based on the current industrial needs, planning dual programs, interdisciplinary doctoral programs, and research projects
The Engineering University that offers advanced graduate programs, provides services to industries, and undertakes global consultancy projects	Planning up-to-date undergraduate, postgraduate, and interdisciplinary doctoral programs; Planning consultancy programs under international development agencies; Offering interdisciplinary research and development programs	Up-to-date equipment, educational resources, online facilities, companies, collaboration with international universities, multinational/transnational companies, and research parks	Outstanding engineering programs and training facilities for highly qualified faculty members with intrinsic motivation and skills in designing complex consultancy projects	Faculty with outstanding accomplishments, highly motivated to undertake sponsored research and development projects, and skills in planning international conferences, and diverse faculty development programs
Institutes of National Importance offer Interdisciplinary Graduate/ Doctorate Programs and undertake global Projects	Global programs to meet the needs of transnational companies, planning and bidding for research and development programs for multinational companies	World-class resources, up-to-date curricula and infrastructure, sufficient funds, and more internal revenue generation	Challenging projects, demand for industry- ready graduates, and opportunities to bid for complex projects under MNCs and IDAs	World-class faculty with enormous accomplishments and proven skills in outstanding interdisciplinary research projects
Centers of Excellence Besides offering all types of graduates, postgraduate, and doctoral programs; They undertake complex interdisciplinary projects	Challenging interdisciplinary projects and programs, training opportunities to develop diverse global graduates, and creating intellectual products for companies; Capable of jointly working in research parks with MNCs	Unlimited world-class resources, funds, unlimited delegated authority, and academic autonomy; Patents and intellectual properties, which fetch more royalties	Industry-sponsored and interdisciplinary postgraduate and research projects; Letters of invitation from MNCs and IDAs; Graduates are ready to create startups	World-class faculty members with outstanding publications in various international journals and conferences; World-class achievement in global consultancy works

MSMEs, micro, small and medium enterprises; MNCs, multi-national corporations; IDAs, international development agencies; ILO, International Labor Organization.

programs, bid for complex projects, and undertake sponsored research and development. The training program is to be designed through a needs analysis. It may include intensive training in emerging technologies and problem-solving.

Step 4: Scaffold them. During execution, faculty members may face numerous bottlenecks and need scaffolding. This may include counselling, coaching, and mentoring. If necessary, additional industry experts could be brought in.

Step 5: Periodically review accomplishments. As they progress, the impact of technology will be at its maximum, and their performance must be reviewed against the new environment. This can be an appreciative inquiry in which the faculty member identifies both accomplishments and areas for improvement. To overcome the shortfalls, appropriate additional support can be offered.

Step 6: Reward. The reward may take many forms, such as a lump sum grant, a citation, a promotion, nominating

Table 5: The proposed model comprises six different factors: Goal, resources, training, review, and reward

Goal (G)	Resources (R)	Training and Facilitation (T)	Scaffolding (S)	Review (R)	Reward (R)
Fix the goal for faculty performance	Improve the resources and infrastructure	Identify the need to train the faculty to grow and achieve the goals	Provide scaffolding when the faculty needs it, and provide autonomy to plan interdisciplinary and industry-specific programs	Conduct periodic appreciative inquiries and plan additional development programs	Reward the excellent performers and offer additional autonomy to plan innovative courses and projects
Link the goals to the institute's vision	If possible, get a soft loan from the International Development Agency	Plan needed external training programs, MOOCs, in-house programs, or summer school programs of the National Councils	Counsel the faculty members; Create a mentor who can advise the faculty members; Suggest a team of team members to collaborate on the proposed project	If necessary, establish an expert committee to evaluate the performance and recommend any additional training	Get feedback from the faculty on the assistance offered and the outcome of the inquiry
Conduct an orientation for other faculty members who are interested in undertaking development projects	Assess the resource needs and augment them	Assess the training needs of a fresh team of faculty members	Guide them in planning an innovative consultancy program or a new, industry-relevant initiative	Prepare a questionnaire and circulate it to the team members; Analyze the feedback	Publish their Achievements; Rank the outcomes. Try to include them for rewards

MOOCs, massive open online courses.

them for advanced training programs offered by an international university, or offering sabbatical leave to participate in the research program.

The radical implementation of this model depends on the organization's vision, resources, focused mission, culture, equity, and empowerment (Table 1–5).

An instrument to get the progress and feedback

Sample instruments are presented in the Annexure. A local expert group must review the completed feedback. A discussion with the faculty will be beneficial. According to the policy, rewards can be finalised and presented (Supplementary materials 1).

DISCUSSION

This model has been field-tested through the Asian Development Bank-assisted project, the United Nations Development Program (UNDP)-assisted project, and the World Bank-assisted project. The success of institutional development depends on identifying the needs of fast-growing companies and on building linkages with engineering institutions. An opportunity analysis identified the following factors: Supplying human resources, training skilled workers, training executives, offering consultancy, offering solutions to problems, offering intellectual products.

Based on the needs of outstanding faculty members, a reward model, "GRTSSR" has been formulated and verified through a series of externally funded projects by international development agencies.

Common challenges to recognition programs

Although recognition programs offer numerous

benefits, they also face several challenges that can hinder their effectiveness. The following are common issues: (1) Lack of clear criteria. If the criteria for recognition are unclear or inconsistent, faculty may feel that the process is unclear or biased. (2) Infrequent recognition. Sporadic recognition can make faculty feel undervalued. Consistency is key to maintaining motivation and engagement. (3) One-size-fits-all approach. Using a uniform approach to recognition might not resonate with everyone. Tailoring recognition to individual preferences can make it more meaningful. (4) Ignoring team efforts. Over-emphasizing individual achievements can demotivate team players. It is essential to recognize both individual and team contributions. (5) Limited access to recognition. If only specific departments or centers within the institution are recognized, it can create feelings of inequality and resentment. (6) Lack of leadership support. Without buy-in from leadership, recognition programs might not receive the attention and resources needed to be successful. (7) Failure to measure impact. Not tracking the effectiveness of the recognition program can make it challenging to identify areas of importance and demonstrate its value. (8) Budget constraints. Limited financial resources can restrict the types and frequency of recognition, but creative, non-monetary recognition can also be very effective. (9) Cultural misalignment. Recognition programs that don't align with the institution's culture and values may be perceived as inauthentic or insincere. (10) Overemphasis on research. Focusing too much on tangible rewards rather than the act of recognition itself can lead to a transactional mindset among faculty members. (11) Addressing these challenges requires careful planning, ongoing evaluation, and a commitment to fostering a culture of appreciation. One has to resolve

all the challenges before choosing the rewards.

Piloting the model

(1) Designing diverse global faculty development programs and implementing them that are sponsored by the Ministry of External Affairs and the Ministry of Finance, Government of India. (2) Planning, bidding, and implementation of consultancy projects under various international development agencies like the Asian Development Bank for Nepal Education Program (NEP) 974 for faculty development in 15 vocational areas; Planning Faculty Development in Technical Education sponsored by the UNDP for Bhutan, (3) Institutional development (Capacity development, quality improvement, and efficiency improvement) under the World Bank for Technician Education, and (4) Developing M. Sc. (Forestry) Curriculum for the Indian Council for Forestry Research and Education under the Ministry of Forest, Government of India, under the World Bank-assisted project. All these projects have been evaluated through various components of this model. The best institutions have been selected and funded for implementation.

Donors for rewarding the excellent faculty in the specified area

The Alumni Association, Multinational Companies, Philanthropies, Professional Associations, Industries, and the Come Forward fund rewards in selected areas. Institutes can use a part of project gains to reward the best performers.

Limitations

This research is based on the ongoing developments in Indian engineering Education. There should be leaders with integrity, equity, ethics, and a global focus. There is no room for imposing unethical practices or discrimination. The model is based on the institutional needs to serve the industry and community.

Suggestions for further research

It is recommended that the needs of human resources in the fast-growing industry, available resources, faculty expectations, and socioeconomic conditions be analysed. Many universities have an appropriate reward system, as well as laws enacted by local governments. This model can be tested and improved for implementation.

CONCLUSION

A strong relationship between engineering institutions and industry alone will improve products. Almost all world-class universities have mastered the linkage process between suppliers and users. Outstanding universities have implemented criteria for recognition that align with educational goals and values, ensuring

contributions to students' success, research, and community engagement. A model for rewarding the well-performing faculty team has been developed, consisting of (1) goal, (2) resources, (3) training, (4) scaffolding, (5) review, and (6) reward. The steps in implementing this model have been presented.

DECLARATION

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Author contributions

Vedhathiri T: Conceptualization, Writing—original draft preparation, Reviewing and editing, Supervision, and Project administration. The author has read and approved the final version of the manuscript.

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Ethics approval

Not applicable.

Informed consent

Not applicable.

Conflicts of interest

The author declares that there is no conflict of interest.

Use of large language models, Artificial Intelligence (AI) and machine learning tools

No AI tool was used.

Data availability statement

No additional data.

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