Enhancing Competence of Agricultural Faculty: Towards Piloting Agriculture-led Development
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MESSAGE

Education is the backbone for the growth and development of a nation. India being an agrarian-dominated economy, agricultural education plays an important role in equipping the human resources for enhancing agricultural productivity and sustainable use of natural resources, towards piloting an agriculture-led development.

Agricultural human resource development is a continuous process undertaken by various central and state agricultural universities under the National Agricultural Research and Education System (NARES). The competence and performance of the teachers are fundamental for enhancing the quality of the educational program and produce efficient professional graduates and post-graduates, who in turn would serve the various domains of agricultural sector. There is limited research on the personality characteristics of teachers, their teaching and research aptitudes, teaching competences and their training needs. The studies undertaken by NAARM in this regard provide some insights for formulating the policy for recruitment, selection and capacity building of the faculty in agricultural universities.

I appreciate the authors for bringing a policy brief on this particular domain, which is timely and I hope that this would aid in aligning agricultural higher education in the context of the new National Education Policy.

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New Delhi
Enhancing Competence of Agricultural Faculty: Towards Piloting Agriculture-led Development
Agricultural Education for Fueling Aspirational New India

Agriculture plays a vital role in India’s economy. It accounts for 16.0 percent of the country’s Gross Value Added (GVA) at current prices in 2018-19 (DAC&FW, 2019). To achieve the ambitious target of New India to be a 5 trillion economy by 2025, agriculture – a sector which engages about 55 percent of the country’s population, directly or indirectly, has to respond with its full potential. It is imperative that the professional graduates from agriculture and allied sciences, serving in various domains of agricultural sector within the public and private realm, would play a significant role in realizing the dreams of the aspirational New India. The quality of the graduates largely depends on the quality of education imparted in the institutions of higher learning in agriculture, which in turn depends largely on the competences of the faculty members. The competences of the teaching faculty in Agricultural Universities assume great significance in “building the New India”, as envisioned by GoI (Fig.1).

![Diagram showing the link between competency of faculty and sectoral development.]

*Fig. 1. Schematic link between of Competence of Faculty and Sectoral Development*
At present, Indian higher agricultural education embraces 64 State Agricultural Universities (SAU's), 3 Central Agricultural Universities, 4 Deemed Universities and 4 Central Universities with Agriculture Faculty. There are 650 Agricultural Colleges. These institutions annually admit about 40,000 students at different levels in agriculture and allied sciences in the country. There are about 3 lakh professional agricultural graduates serving the central and state development departments and the private sector. There are about 42,000 professionally trained agricultural graduates serving the National Agricultural Research and Education System (NARES), which includes the Indian Council of Agricultural Research (ICAR) and Agricultural Universities, specialized in about 90 different disciplines of agricultural sciences, covering horticulture, animal sciences, fisheries, engineering, and social sciences.

The human resources developed by the National Agricultural Education System played a pivotal role in transforming agricultural scenario in the country by achieving self-sufficiency in food production. While there are various factors which influence the quality of higher education like funding support, physical infrastructure, quality of human resources, etc., the competence of faculty members plays the most significant role in defining the quality of the graduates from the educational institutions. Hence, it calls for critical review of the current status, identifying issues and advancing policy perspectives to address the gaps.

This Policy Paper attempts to identify the issues and suggest strategies for enhancing the competence of the faculty members serving in the Agricultural Universities.

Educational Quality vs. Teachers' Competence

'Competence' is a task-related capability or outcome and is seen as an array of abilities across domains related to performance in a specific context, whereas 'competency' concerns a particular ability and is an individual-oriented state.

The quality of any educational program is largely determined by the competence and performance of its teachers. The definition of quality teaching is related to teacher's knowledge, values, aptitude, and attitude. Teaching competences focused on the role of the teacher in action in the classroom, therefore directly linked with the craft of teaching. Teacher competences cover the full gamut of the profession of a teacher and can be considered to include the multi-faceted roles of teachers in multiple levels i.e., of the individual, college, local community, and professional networks.

It is established that there lies a strong relationship between teacher competence and effective teaching. Teachers' competences, like their professional knowledge, skills, beliefs and motivation, affect their values, behaviors, communication, aims and practices, and also serve as a critical predictor of their well-being and success. The general academic ability of the teachers does not contribute to their professional competence or affect student outcomes as much as their pedagogical content knowledge, professional beliefs, work-related motivation, enthusiasm for teaching, and self-regulatory skills on instructional quality.
Research on Agricultural Education at NAARM

The research on teaching/research aptitude, academic excellence and teaching competencies lay the foundation for policy advocacy (Ramesh and Krishnan, 2020). NAARM has spearheaded a few focused studies to formulate evidence-based policy advocacy on agricultural education management.

In a study conducted on the teaching aptitude and personality characteristics of the existing 500 faculty members of different Agricultural Universities in India, it was observed that 28.8 percent of faculty had 'Average' to 'Low' level of teaching aptitude as against 55.4 percent with 'Above Average' teaching aptitude. This reflects the quality of teaching/education, warranting institutionalization of need-based capacity building programs for them (Ramesh and Reddy, 2015).

A study was conducted to characterize the academic achievement, teaching aptitude and research attitude of the faculty members of Indian Agricultural Universities (n=500). The results indicated that a combination of academic achievement and teaching aptitude is superior predictor for teaching achievement, compared to either of them, individually. Similarly, the research achievement of faculty was predicted better by the combination of academic achievement and research attitude. The study highlighted the need-based training for improving in-service faculty members’ interpersonal, team building, leadership skills so as to improve their personality besides boosting their commitment to the organization and for the profession (Ramesh et al., 2017).

Periodic Competency Need Assessment (CNA) of faculty at all levels i.e. young, mid-career and senior-level is required and there is a need for developing programs for quality agricultural education (Thammi Raju et al., 2017).

A study conducted among the students, faculty members, and administrators from various State Agricultural Universities to assess the training needs of faculty members based on 28 pre-identified teaching competencies showed that perceptions towards teaching competencies among the groups differed with their roles. The prioritized training needs identified based on the Mean Weighted Discrepancy Scores (MWDS) as described by Borich (1980), provide the content and direction for development of in-service educational programs for the faculty members. The training needs of the agricultural faculty against different competences, grouped into six teaching domains are summarized in Fig. 2. The study indicated that the competencies related to attitude and values need to be accorded the highest priority followed by that in teaching strategies/communication skills (Ramesh et al., 2019).
Fig. 2: Average perception of teachers’ knowledge levels of different teaching competencies
(Length of the arms represent the mean weighted discrepancy scores and colour the perception indices)

1 – Command on subject matter knowledge; 2 – Updating of subject matter knowledge; 3 – Sharing and exchange of subject matter knowledge; 4 – Command and application of pedagogical content knowledge; 5 – Curriculum design, implementation and improvement; 6 – Updating and sharing of pedagogical content knowledge; 7 – Knowledge and application of teaching strategies and skills; 8 – Language proficiency; 9 – Motivation of student learning through different teaching methods; 10 – Use of multimedia and web based technologies for teaching (ICT use); 11 – Student assessment methods and procedures; 12 – Use of student assessment results (Feedback); 13 – Evaluation and review of teaching and learning programmes; 14 – Importance of lifelong learning; 15 – Ability to reflect and evaluate one’s own performance; 16 – Dispositions to change and flexibility; 17 – Commitment to promote learning of all students; 18 – Have a positive attitude towards students; 19 – Under Graduate advising, guidance and counselling; 20 – Post Graduate & Ph D Guidance; 21 – Awareness and knowledge of policies related to education; 22 – Issues of inclusion and diversity; 23 – Cooperating with colleagues, groups and organizations; 24 – Research /scientific skills; 25 – Leadership skills; 26 – Mentoring skills; 27 – Time management skills and 28 – Classroom management skills.
Enhancing Competence of Faculty Members in Agricultural Universities

Based on the above studies, it is clearly understood that competent teachers/faculty play an important role to improve the quality of agricultural education. The recruitment, selection and placement of competent faculty and their need for upgrading their knowledge, skills and attitude, periodically through appropriate capacity building programs aid in enhancing their contribution to quality teaching and research. In order to improve the educational quality, competency-based selection and training of the faculty is crucial for the long-term benefit of the educational institutes. Thus, selection of competent personnel is the most important function of human resource managers. Competence comprises integration of knowledge, skills and attitudes indicating the capability to perform professional tasks adequately and ethically.

The policy options for enhancing the teaching competency of the agriculture faculty are summarized under three broad categories:

A. Creating a Pool of Candidates with Core Skills

The effectiveness of the selection would essentially depend on availability of adequate candidates with the core knowledge and skills required to perform as a teacher in higher education.

The interventions required to strengthen this cause are:

Enhance Student Intake: The Agricultural Universities account for 9 percent of the overall Universities in India, while the total enrolment in agricultural and allied universities account for less than 1 percent of the total enrolment in the higher education (Draft National Education Policy - DNEP, 2019). In the light of the promise offered by the agricultural sector, the student strength in the colleges has to be enhanced significantly. Further, the Government of India has issued a policy directive that from 2021 onwards, PhD would be the essential qualification for all faculty positions in institutions of higher learning including Agricultural Universities. ICAR should strengthen its scholarship program to encourage a large number of graduates to pursue higher education.

Aligning Agricultural Education with NEP, 2019: The Draft National Education Policy of India (2019) envisions the Universities to provide for Imaginative curriculum and pedagogy; flexibility in undergraduate program with scope for rigorous specialization and establishing Departments of Education with multidisciplinary expertise. Agricultural education shall be the front runner in imbibing these futuristic paradigms of the National Education Policy.

Review PhD Course Curriculum: Currently, the PhD curriculum focuses on the research dimension only. As higher education is one of the major areas, where the candidates, after their doctorate are likely to be serving and influence the academic and research-scape of the country in the future, it is imperative to instil certain basic
attributes related to higher education in the PhD curriculum as well, as envisioned in the DNEP (2019). Further, the Doctoral students should be given Teaching Assistantship so that they develop the abilities in curricula delivery.

**Stable Fundamentals:** Education, particularly the higher education is to be structured based on the fundamental premise that it aids in *preparing one to face the unknown future and not for the contemporary employment opportunities*. The top paying jobs of today viz., data scientist, application developer, sustainability expert, social media manager, etc., were not known a decade before.

Thus, the advancements made in agricultural science shall be the prime driver during the national exercises for revision of curricula in agriculture and allied areas and also in defining the nomenclature under which PG specializations are offered, without the influence of the prevailing job opportunities in various streams in private and public sectors.

**B. Selecting the Right Candidate**

**Knowledge in Higher Education:** Administration of Higher Education poses different challenges. While a Certificate, Diploma, or Bachelor Degree in Education (B.Ed.) is considered essential for serving as school teachers, no formal training in education is mandated to be a faculty in collegiate/higher education.

ICAR shall develop a national curriculum for a Certification Program in Agricultural Higher Education and offer the same as a Massive Open Online Course (MOOC). The course may be open to all agricultural graduates and institutionalized by recognizing it as a desirable qualification for selecting the faculty members for the SAUs.

**Re-design Qualifying Test:** The National Eligibility Test (NET) conducted by ICAR, in order to ensure minimum standards for those who aspire to serve as a faculty in any institute of higher education, essentially tests the subject knowledge. With PhD becoming essential, NET would require a total revamp – from the current knowledge-centric test to assessing the aptitude for teaching and research. It is a pre-requisite to create a large pool of candidates with the minimum essential qualification to become a faculty (PhD in agriculture and allied sciences) with necessary aptitude, attitude and core competencies.

**Communication is Key:** Apart from academic qualification in the area of specialization and PhD/NET qualification, some Universities mandate the applicants to give a seminar or presentation on any subject topic before the selection committee to test their communication skills and teaching aptitude. However, in order to make the selection process robust, presentation must be made mandatory and guidelines on the mode of conducting the same across the Universities need to be developed.

**Selection Criteria for Lateral Entry:** In addition to entry level selection, the middle and senior faculty positions are filled through lateral entry also. The criteria used are experience, research publications, projects, institution building, etc. Often, adequate weightage is not provided for skills in teaching methodologies, innovations and pedagogy, and this issue has to be addressed.
C. Capacity Building of Faculty

Teaching and research are central to the delivery of higher education. However, both these tasks require specialized skills in order to excel. For example, teaching requires qualities like subject knowledge, communication skills and aptitude: while to be a successful researcher, one should have a high aptitude for research, innovation and creativity. To be successful in any profession, a cluster of personality traits suitable for that profession are required. Psychological attributes viz., aptitude, personality traits and attitude are important components in the selection, placement and training of manpower in any profession including teaching and research.

**Competence Framework for Agricultural Faculty:** Unlike Traditional Universities and Professional Universities (law, medicine, engineering, etc), the Agricultural Universities in India have a significantly very high focus on research. Most agricultural colleges have almost equal focus on research, teaching and extension. This uniqueness justifies the need to develop a separate competence framework for the agricultural faculty with adequate balance on various domains of work.

**Foundation Training for the Faculty:** A Foundation Course or an Orientation Course shall be designed based on the competence framework for the agricultural faculty. All the newly recruited faculty members across the Agricultural Universities shall be mandated to undergo this Course, within one year of their induction into the service.

**Mid-Career Training for the Faculty:** The training needs and the competencies of the faculty members keep changing as their role and responsibilities change with their progress in career. Accordingly, it is essential to design and institutionalize periodic training for all the middle and senior level faculty members of the Agricultural Universities.
Existing Initiatives for Enhancing the Competence of Graduates / Faculty

**Netaji Subhas ICAR International Fellowships:** The ICAR has instituted International Fellowships with dual purpose of (i) human resource development in cutting edge technologies, and (ii) demonstrating the strength of Indian Agricultural System abroad. The Fellowship provides for developing competent human resource by training them in the renowned laboratories in the world. It also provides for exposing overseas candidates to the Indian Agricultural Universities (AUs) for creating a pool of scientist-envoys for enhanced future co-operation.

**Post-doc Fellowships in Deemed Universities:** The ICAR Post-Doctoral Fellowship (ICAR-PDF) programme, aims at supporting the bright, talented and motivated young researchers of the NARES to pursue research in frontier areas of national interest in Agriculture and Allied Sciences. The Scheme provides a platform for the candidates to develop as an independent researcher capable of initiating a new programme in nationally important priority areas under the supervision of a mentor.

**Training in Higher Education:** The Indira Gandhi National Open University (IGNOU) offers a Post-Graduate Diploma in Higher Education (PGDHE) covering all facets of higher education. ICAR-NAARM offers a Post-Graduate Diploma in Education Technology and Management (PGDETM), with special focus on harnessing the advances in the digital technology for higher education.

**Foundation Training for Entry Level Faculty Members:** The ICAR-NAARM has designed a comprehensive course module covering all core aspects viz., teaching methods, pedagogy, curriculum development, research management, scientific communication, digital technology in education, extension approaches, etc., for a period of 30 days. The module is designed in the lines of the Foundation Course for Agricultural Research Service (FOCARS) at NAARM. A 10-days Induction Course, offered by NAARM exclusively for the entry level faculty members of AUs also caters to this need.

**Summer Schools/Winter Schools:** ICAR supports academic institutions for organizing these programs to bring qualitative improvement in the pedagogical skills of teachers, researchers and extension specialists; and also to update their knowledge in the specialized/emerging areas. The Centres for Advanced Faculty Training (CAFT) provide for imparting discipline-oriented advanced training to teachers, researchers and extension specialists in cutting-edge areas of agriculture and allied sciences to develop skilled human resources across NARES.
Policy Recommendations

1. **Enhance intake of Students**: It is essential to enhance the intake of agricultural graduates to create a large pool of candidates with the minimum educational qualification, and ICAR shall enhance its fellowships to attract more graduates to higher education.

2. **Specialization in Under-Graduation**: The Universities shall provide for imaginative curriculum and pedagogy; flexibility in under-graduation program with scope for rigorous specialization. Departments of Education with multidisciplinary expertise shall be established in all Agricultural Universities to facilitate this, as recommended DNEP (2019).

3. **Review PhD Course Curriculum**: Given that PhD is all set to be the essential qualification for anyone to be recruited as a faculty in AUs, it is imperative that the curriculum of PhD should be revised across all the Agricultural Universities to include adequate credits on educational technologies per se, as also envisioned in the DNEP (2019).

4. **Revision of NET**: The National Eligibility Test (NET) should be revised to test the candidates’ aptitude for teaching and research, besides its current exclusive focus on testing academic and professional proficiencies.

5. **Certificate Course on Education**: ICAR shall offer a certificate program in Agricultural Higher Education as Massive Open Online Course (MOOC) for all agricultural graduates, which may be considered as a desirable qualification for selecting the faculty members for the SAUs.

6. **Foundation Course for Newly Recruited Faculty**: A comprehensive module shall be offered to all the newly selected faculty members of Agricultural Universities as a mandatory Foundation Course, so as to ensure smooth transition of the entry-level faculty into their professional career.

7. **Guidelines for Selection and Promotion**: ICAR shall develop guidelines for testing the communication skills of potential candidates while recruitment of new faculty. The criteria for Career Advancement Scheme (CAS) shall provide adequate weightage for skills in teaching and research competence, so as to bring the culture of much needed entrepreneurship among staff and students.

8. **Mid-career Training for Faculty**: The periodic shifts in the training needs of the faculty members across different levels shall be profiled and appropriate capacity building programs shall be developed. Such mid-career training programs shall be offered through innovative means, so as to not warrant prolonged dislocation of faculty members from their place of work. The faculty members shall be incentivized to undergo online courses on education from reputed institutions, by fincically supporting them and also by integrating the same in their career advancement.
References


