

# Reinforcing Research in Higher Education for Quality Enhancement in Industry and Educational Institution

S. Devaraju<sup>1</sup>, S. Jawahar<sup>2</sup> and A. Harishchander<sup>3</sup>

<sup>1</sup>Shool of Computing Science and Engineering (SCSE), VIT Bhopal University, Bhopal, Madhya Pradesh, India

<sup>2</sup>Department of Computer Technology, PSG Collage of Arts and Science, Coimbatore, Tamil Nadu, India

<sup>3</sup>Centre for Excellence in Computational Engineering and Networking,

Amrita Vishwa Vidyapeetham University, Coimbatore, Tamil Nadu, India

E-mail: devamcet@gmail.com, shivamjawahar@gmail.com, harishchander.a@gmail.com

(Received 13 September 2021; Accepted 2 November 2021; Available online 10 November 2021)

**Abstract** - Higher Education is one way to acquire more knowledge and skills. This knowledge and skills are influenced by the students or employees learning to work with more ability in the industry for excellence rather than survival. Higher Education Institutions (HEIs) are working in the highly dynamic states all over the world. Most universities and autonomous institutions are reframing their curriculum and syllabus based on the industry requirements. The higher education institution should focus on the quality of teaching through various teaching aids. This teaching aid helps the students to understand the concepts very clearly and it is possible to apply their knowledge in the industry environment. The industry also focuses on role-ready engineers, though the institution and industry are working closely to produce the role read engineers. It is possible to improve the quality of higher education teaching with research collaboration between the institution and industries. Industry always looks at the research areas based on the student or employee perception. Research is only the way to get more innovative ideas and new thoughts to produce a better-quality education, although it is necessary to retain effective teaching through research at the institution and Industry environment.

**Keywords:** Higher Education Institutions, Learning, Curriculum and Syllabus, Autonomous Institution, Universities, Engineers, Industry, Industry Environment

## I. INTRODUCTION

Higher education in the 21<sup>st</sup> century plays a vital role in other aspects of individual life such as improving the overall quality of individual life, individual health, and more opportunities in their life. Today, more students are struggling to see the consequence of their college education which provides the best job opportunities and a comfortable lifestyle for their individual life. In fact, few the individuals claim that higher education is important to get ahead in life and few the individual feel that going to college would have improved their present standard of living significantly. Higher education in the 21<sup>st</sup> century includes Economic, Health, Civic Involvement, Personal Development, Better Communication, Realization of Passions, Greater Sense of Discipline and Sense of Accomplishment. Higher education not only trains individual chosen field, but also trains the individual to understand subjects that are complex, think analytically and ability to communicate in an effective way. Higher education provides a competitive edge in individual

life. Unemployment is very critical for youngsters to settle in their life. The industry also expects the knowledge and skills of the individual in respective field of study due to more competent to get job in any industry. Always the individuals are capable of experts in particular field such as think, analyze explore new ideas, ask questions and be creative.

## II. CAREER OPPORTUNITIES IN HIGHER EDUCATION

Higher education opportunities are categories into three different ways namely trends in higher education, importance in higher education and research in higher education.

### A. Trends in Higher Education

Normally, higher education might be a bachelor's degree or master's degree which degree gives more employment opportunities in the industry. Innovation is the most popular in industry to adopt the latest technologies to achieve the societal problem. Most universities and autonomous colleges are reframing curriculum aspects as per the requirements of the industry. Students might be able to understand and apply their skills in the relevant area of study. The bridge between the colleges and industries must achieve the common requirement of a societal problem. The students always rethink and communicate effectively.

The graduate is not only providing the knowledge but also provides the skills to apply in real-world problems. Either graduate or postgraduate, they must get knowledge in an emerging field like learning analytics. The main objective of the autonomous institution is to fulfill the gap between the institution and the industry environment. Universities and autonomous institutions can leverage the gaps within a student's background. Research is one aspect to teach the students more practically. It is important in teaching come munity in the knowledge to understand conceptually, technically, and analytically with enough communication skills. Blooms taxonomy may include remembering, understanding, applying, analyze, evaluating and create.

This taxonomy helps the students to get stronger skills to apply in the real-time industry.

*B. Importance in Higher Education*

The roles of higher education in viable of getting the knowledge and skills, the institution and industry will collaborate to define the industry-driven curriculum to meet out the expectation of today’s industry environment. It is looked at to improve the quality of life and address major social and global challenges. Higher education is mostly defined as key factors for developing performance and effectiveness. Higher education is divided into various important roles such as Creating a quality workforce, supporting business & industry, and caring out research & promoting technologies.

The higher education statistical data has been collected from various sources. The arts and science statistical data were collected from Bharathiar University and engineering statistical data collected from Anna University approximately.

TABLE I HIGHER EDUCATION IN VARIOUS INSTITUTIONS

Institutions/Courses	Arts	Science	Engineering
Government	69	69	15
Government Aided	162	162	12
Self-Financing	416	416	545

Table I shows how higher education is important in acquiring knowledge and skills for various types of education institutions. It can be clearly seen that the total amount of institutions varies across the different institutions. According to table I, there is a very large variation in arts & science and engineering for various groups.

There are a total of 231 governments and aided arts and science institutions and a total of 27 government and aided engineering college, the former institutions which constitutes a major part of the higher education sector. Figure 1 shows the Higher Education in various Institutions.

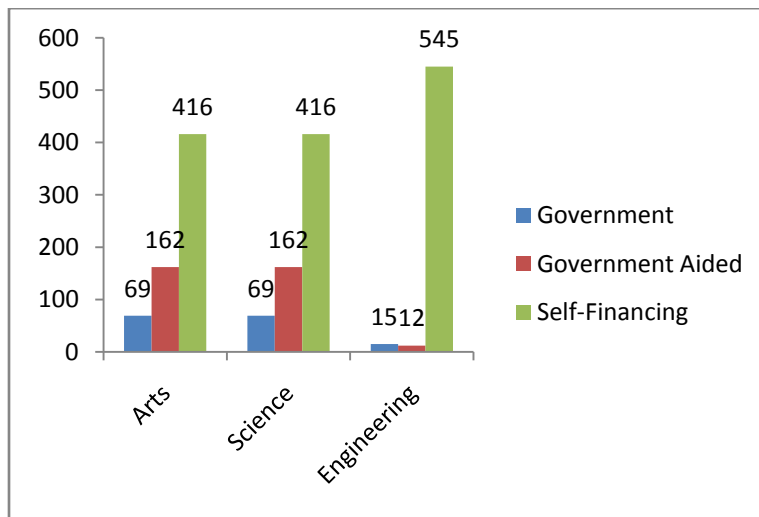


Fig. 1 Higher Education in various Institutions

In self-financing totally 416 institutions in arts and science and totally 545 self-financing colleges in which the latter constitutes the more part in the higher education.

*C. Research in Higher Education*

The major objectives of higher education are to bring the faculties and projects to cultivate the industry requirements across the world. Higher education wants to define the policies more clearly to take up the projects in the right direction. The students and faculties must take part in applying the funding proposal to solve the suitable societal problems. Research is the way to get a greater number of innovative ideas about the societal environment.

It is a challenging task to prepare and approve the projects within the required budget which increases the demand,

changes employment needs, the impact of new ideas, and issues in staffing. Higher education is also providing opportunities and challenges to bridge cap between the institution and industry. There are various research fields such as the teaching-learning process, student employability, academic activities with professional development, governance, setting of diversity, and internationalization in Higher Education. The opportunities and challenges are considered for research from social, economic, cultural, political, and technological advances.

**III. HIGHER EDUCATION THROUGH RESEARCH LEVEL**

Higher education generally focuses on various research fields with funding from different agencies through the research level. Table II represents the research data from different research levels.

TABLE II RESEARCH DETAILS OF HIGHER EDUCATION

Institutions/Categories	Total number of Employees	Total number of Employees with M.Phil.	Total number of Employees with Ph.D.	Proportion of Research Funding
Arts	602	144	48	46
Science	1038	791	453	24
Engineering	1503	-	729	83

The table II shows how higher education through research is vital in knowledge and skills for employees in education institutions. The total amount of employees varies across the different institutions with various higher education. According to table II, there are 935M. Phil. employees in arts and science fields of education. There are a total of

1640 arts and science employees with higher education Ph.D. and total of 1503 engineering employees with higher education, the latter employees constitute a major part of the higher education sector. Figure 2 shows the Research details of Higher Education.

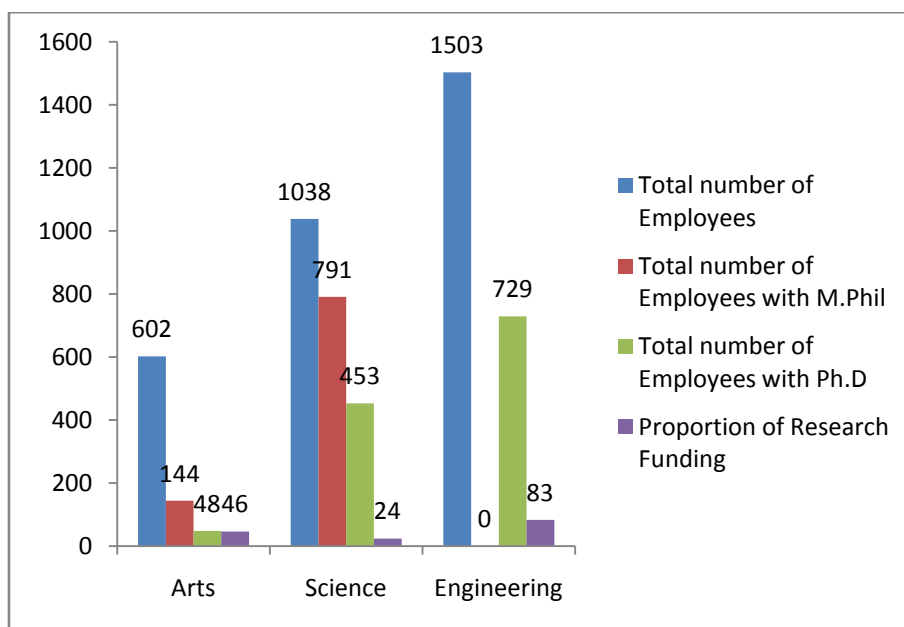


Fig. 2 Research details of HEI

The research funding among various employees varies, arts and science contain a total of 70 funding through different research agencies and the engineering stream contains a total of 83 grand funding through various research agencies.

#### IV. HIGHER EDUCATION AT THE INSTITUTION LEVEL

Higher education generally focuses on various research fields with funding from different agencies through the institution level. Table III represents the research data from different institution levels.

TABLE III INSTITUTION DETAILS OF HIGHER EDUCATION

Institutions/ Categories	Total number of Faculties	Total number of Faculties with M. Phil.	Total number of Faculties with Ph.D.	Proportion of Research Funding
Arts	1638	972	561	28
Science	1952	1182	679	33
Engineering	2097	-	853	54

Table III shows how higher education impacts the institution with different research funding. The total amount of employees varies across the different institutions with various higher educations. There is total of 3590 arts and science faculties in arts and science and a total of 2097 engineering faculties in higher education. The total number

of faculties with Master of Philosophy in arts and science stream is 2154 which constitutes the most part of the higher education. In arts and science stream totally contains 1240 Ph.D. graduates which total 61 faculties with ongoing research funding from various agencies. Figure 3 shows the Institution details of Higher Education.

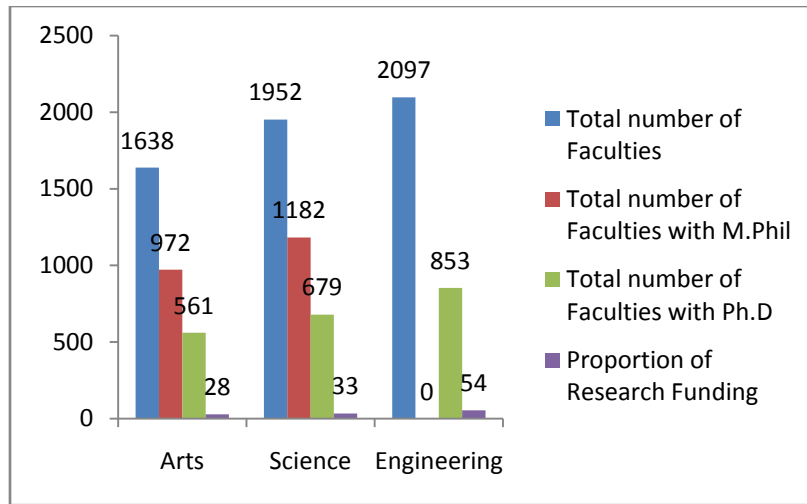


Fig. 3 Institution details of HEI

In engineering stream totally contains 853 Ph.D. graduates of which a total of 54 faculties have ongoing research funding from various agencies. The engineering employees with higher education, and the later employees constitute a major part of the higher education sector within the employees.

### V. HIGHER EDUCATION AT THE RESEARCH INSTITUTIONS LEVEL

Higher education generally focuses on various research fields with funding from different agencies through the industry level. Table IV represents the research data from different industry levels.

TABLE IV RESEARCH INSTITUTION DETAILS IN HIGHER EDUCATION

Institutions/ Categories	Total number of Employees	Total number of Employees with M. Phil.	Total number of Employees with Ph.D.	Proportion of Research Funding
Arts	254	74	146	78
Science	343	95	214	92
Engineering	478	-	317	179

Table IV shows how higher education through research institutions for employees. The different research institutions contain a various number of employees vary across the higher educations. According to table 4, there are a total of 597 arts and science employees in arts and science

and totally 478 engineering employees in higher education. The total number of employees with a Master of Philosophy in arts and science stream is 169 which constitutes the most part of the higher education.

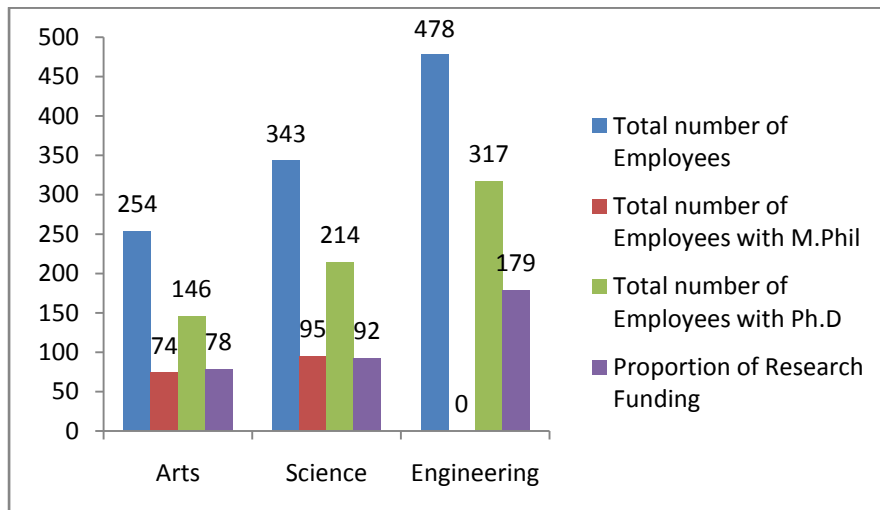


Fig. 4 Research Institution details in HEI

In arts and science stream totally contains 360 Ph.D graduates in which totally 170 employees ongoing research funding in various agencies. In engineering stream totally contains 317 Ph.D graduates in which totally 179 employees ongoing research funding in various agencies. The engineering employees with higher education, the later employees constitute a major part of the higher education sector within the employees.

## VI. SUMMARY

Higher education plays an important character in individual life such as improving the overall quality of individual life, individual health, and more opportunities in their life. Higher education must improve the quality of research rather than teaching. Normally, the institution and industry want to collaborate to solve the societal issues. The quality of higher education is to collaborate the institution and industry to strengthen the research aspects which leads the institution and industry in next level. The research is only the way to get more innovative ideas and new thoughts to produce the better-quality education. While collaborating, there are few key questions arises, they are:

1. In what way the higher education will help the individual?
2. What are the various advantages of research field?
3. To what extent the research will influence the individual?
4. What are the implications of industry and institution policy?

## VII. CONCLUSION

Higher education is focused on developing research activities among students and faculty. But the issues are still currently evolving in the academic profession. Students and faculty must involve in solving societal issues. Therefore, understanding and analyzing the issues in the current scenario should be able to enhance the policy of the academic profession. If the current issues are solved correctly, it should be able to uplift the quality of student's and faculty's research. In essence, students and faculties should study the problem and solve it through their innovative thinking ability rather than getting knowledge. Bloom's taxonomy is also influencing the students and

faculties to understand and apply the societal issues. Therefore, the research will help the students and faculties to get more innovative ideas and new thoughts to produce the better-quality education. The institution and Industry should be able to collaborate with each other to solve the societal issues in higher education through different environment.

## REFERENCES

- [1] Zubrick, I. Reid, and P.L. Rossiter, "Strengthening the nexus between teaching and research (Vol. 6499). Department of Education," Training and Youth Affairs, Higher Education Division, Evaluations and Investigations Programm, 2001.
- [2] J. Robertson, and G. Blackler, "Students' experiences of learning in a research environment," *Higher Education Research & Development*, Vol. 25, No. 3, pp. 215-229, 2006.
- [3] C.A. Buckley, "Student and staff perceptions of the research-teaching nexus," *Innovations in Education and Teaching International*, Vol. 48, No. 3, pp. 313-322, 2011.
- [4] L. Geschwind, and A. Broström, "Managing the teaching-research nexus: Ideals and practice in research-oriented universities," *Higher Education Research & Development*, Vol. 34, No. 1, pp. 60-73, 2015.
- [5] K. Grant and S. Fitzgerald, "The nexus between teaching and research: A qualitative study using two focus group on academic information systems teachers," *Electronic Journal of Business Research Methods*, Vol. 3, No. 1, pp. 37-56, 2005.
- [6] W. Locke, "Reconnecting the research-policy-practice nexus in higher education: 'Evidence-based policy' in practice in national and international contexts," *Higher Education Policy*, Vol. 22, No. 2, pp. 119-140, 2009.
- [7] A. Amaral, V. L. Meek, I. M. Larsen, and W. Lars, (Eds.), "The higher education managerial revolution?," *Springer Science & Business Media*, Vol. 3, 2003.
- [8] P.J. Bentley, and S. Kyvik, "Academic work from a comparative perspective: A survey of faculty working time across 13 countries," *Higher Education*, Vol. 63, No. 4, pp. 529-547, 2012.
- [9] H. Coates, and L. Goedegebuure, "Recasting the academic workforce: Why the attractiveness of the academic profession needs to be increased and eight possible strategies for how to go about this from an Australian perspective," *Higher Education*, Vol. 64, No. 6, pp. 875-889, 2012.
- [10] J. Elen, S. Lindblom-Ylänne, and M. Clement, "Faculty development in research-intensive universities: The role of academics' conceptions on the relationship between research and teaching," *International Journal for Academic Development*, Vol. 12, No. 2, pp. 123-139, 2007.
- [11] M. Henkel, "Teaching and research: The idea of a nexus. Higher education management and policy", Vol.16, No.2, pp. 19-30, 2004.
- [12] S. Kyvik "Academic workload and working time: Retrospective perceptions versus time-series data," *Higher Education Quarterly*, Vol. 67, No. 1, pp. 2-14, 2013.
- [13] L. Leisyte, "University governance and academic research: Case studies of research units in Dutch and English universities," 2007.