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Multidisciplinary Approach in HIGHER EDUCATION

*An Action in Relation to
India's National Education Policy 2020*



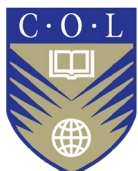
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Multidisciplinary Approach in HIGHER EDUCATION

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Concept: Multidisciplinary

Disciplinary knowledge was the basis of 19th and 20th century university. In the 21st century there is real need to understand the advances in knowledge through the lens of disciplines as well as the dynamic interactions of disciplines in order to find solutions to the problems of society. The perspective on interdisciplinarity is related to a postmodern approach of learning for a fluctuating market conditions and transferrable job skills. Interdisciplinarity is lauded as the gold standard of the progressive modern university Angelique Chettiparamb (2007) presents an overview of literature on multidisciplinary education. A seminar on interdisciplinarity was convened in 1970 and based on the deliberations the report was prepared in 1972. OECD (1972) presents the following definitions of discipline and multidisciplinary education and related terms.

The perspective on interdisciplinarity is related to a postmodern approach of learning for a fluctuating market conditions and transferrable job skills.

Discipline:

A specific body of teachable knowledge with its own background of education, training, procedures, methods and content areas.

Multidisciplinary:

Juxtaposition of various disciplines, sometimes with no apparent connection between them. e.g.: music + mathematics + history.

Pluridisciplinary:

Juxtaposition of disciplines assumed to be more or less related. e.g.: mathematics + physics, or French + Latin + Greek: "classical humanities" in France.

Interdisciplinary:

An adjective describing the interaction among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data, and organization of research and education in a fairly large field. An interdisciplinary group consists of persons trained in different fields of knowledge (disciplines) with different concepts, methods, and data and terms organized into a common effort on a

common problem with continuous intercommunication among the participants from the different disciplines.

Transdisciplinary:

Establishing a common system of axioms for a set of disciplines (e.g. anthropology considered as "the science of man and his accomplishments", according to Linton's definition).

From above definitions it is clear that multidisciplinary and transdisciplinary are two poles separated from each other and interdisciplinarity lies between them. In non-technical sense, Multidisciplinary and interdisciplinary are terms used synonymously. However, in academic jargon, interdisciplinary education is used more frequently than multidisciplinary education.

Multidisciplinary Approach: International Perspectives

OECD 1972 report notes that the origins of interdisciplinarity are found in cultural and intellectual traditions of an academic system. In the USA, the general education is imparted for personal and social development, whereas in Europe, for intellectual and scientific development. In both the systems the interdisciplinarity in teaching and research develops in order to respond to and better able to explain the questions arising out of the needs of the system. The interdisciplinarity, the OECD 1972

report notes, follows many patterns. At times, interdisciplinarity is seen in terms of crisis, whereby the rigidity of the original discipline could be broken. At other times, interdisciplinarity comes about through the conjunction of a discipline with application. At times, greater specialization within a discipline itself becomes interdisciplinary. Most importantly, the specific demand to solve the issues and problems of gender, environment, urban, language, policy, geographical area (Africa,

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Asia, Latin America) etc., the centers or departments in the universities or outside were established where experts from different disciplines were appointed to serve the centers or departments, giving rise to interdisciplinary studies. (See Angelique Chettiparamb, 2007)

OECD Report informs the motives behind interdisciplinarity from the point of view of students, teachers and university. Interdisciplinarity serves various interests of students. Interdisciplinarity allows students adjust to the fluctuations in the job market in the minimum time. From the point of view of students, greater practice-oriented skill and knowledge enables them to fetch a job. However, from the point of view of teachers, interdisciplinarity opens up new fields of knowledge and allows them to be relevant for the society with greater specialization. University thus connects itself with society through the interdisciplinarity.

Squires (1992) examines Interdisciplinarity in Higher Education in the United Kingdom. So far as professional courses are concerned, there is growing

inclusion of new elements in such courses, for example, management studies in engineering, social studies in medicine, foreign languages or computing in others. In the case of academic courses, area study courses, ranging from traditional language and literature, through history, and (more recently) the social sciences and geography are available at the first-degree course curriculum. Theoretical integration is found in biotechnology, cognitive science, communications, operations/systems science. General courses are faculty rather than department based. They are offered in modular fashion in open university and polytechnics. Many of them are multidisciplinary rather than interdisciplinary. In UK context, Geoffrey Squires further notes that the journey towards multidisciplinary has been not so smooth as the shortage of funding by government has led the academia to protect original disciplines rather than go for a painful task of allowing interdisciplinarity.

Universities in Europe have been adding many multidisciplinary courses. Lindblom and Kola note that from the beginning of the academic year 2017-2018, the University of Helsinki launched 32 multidisciplinary bachelor's programmes. The University of Helsinki also supports the arrangement where teachers work in teams in which the teachers represent various disciplines instead of the traditional model where one teacher teaches one course. (Lindblom and Kola, 2018)



Multidisciplinary Approach: National Perspectives

The University Grants Commission initiated in 1963 a programme of providing assistance to selected universities for undertaking studies relating to various aspects of different countries and regions of the world particularly of those with which India has close and direct contact. Area Study Centers are initiatives to promote studies in interdisciplinary framework. For example, School of International and Area Studies (SIAS), Goa University is anchored in the realm of Global and Area Studies with a view to deepening and enhancing pedagogy and research, concerning the specialized disciplines of international relations, defense, security, and strategic studies. The Centre for Canadian Studies at the University of Kerala was set up in 1991 to further India Canada relationship and to explore and promote academic research in Canadian Studies. In recognition of the commendable work done by the Centre, the UGC awarded it the prestigious Area Studies Centre Status in 2003 to promote teaching and research on Canada. The Centre focuses attention on Culture and Literary Studies, Sociological and Demographic Studies, Science and Technology, Political Science and International Relations. Another example is Area Study Centre on India and Asian Studies in Bhagat Phool Singh Mahila Vishwavidyalaya to promote Indo-Asian knowledge systems in sciences, technology, business, management, arts, architecture, ethics, philosophy,

history, culture, societal values, customs and practices, polity and pluralism.

Scheme for Trans-disciplinary Research for India's Developing Economy (STRIDE) was approved by UGC in 2019. Under the scheme large number of proposals across disciplines have been approved.

Multidisciplinary approach to study women's issues may be traced back in 1970s. Both as a result of feminist movement and a *Committee on the Status of Women in India* appointed by the Government of India in 1972, the origin of women's study center may be traced. The report "Towards Equality" pointed out the distressing conditions of women in the spheres of health, employment, societal status and political participation. This led to a unit for research on women in *SNDT Women's University, Bombay*, officially becoming a center in 1985. (Krishnaraj, 2018, UGC 2019) There was funding by the University Grants Commission and Indian Council for Social Science Research in India to promote research on women in an interdisciplinary framework, leading to the establishment of various centers on women's studies.

In the area of policy studies, Indian Institutes of Management (IIMs) and later the Indian Institutes of Technology (IITs), autonomous universities, (applied) social science institutes, law schools, state universities, as well as stand-alone colleges took a lead. In recent

The Centre focuses attention on Culture and Literary Studies, Sociological and Demographic Studies, Science and Technology, Political Science and International Relations.

years many private initiatives are noteworthy in designing courses in public policy for teaching and promoting research and evaluation of government schemes and programmes.

Thus, it may be noted that interdisciplinarity is being practiced in India with a view to find solutions to various social problems which

disciplinary education could not adequately discuss in a holistic way. While some of the initiatives by UGC and lead institutions are noteworthy, in recent years many state universities and colleges are teaching applied courses with multidisciplinary focus. Demand for courses with multidisciplinary focus is growing as knowledge is applied to solving problems in society.

National Education Policy 2020 is an important policy document that provides the vision of the government for modernizing education in India.

NEP 2020, India focus points in Multidisciplinary Education

Yash Pal Committee Report underscores the importance of multidisciplinary education. The report notes “there is a need to expose students, especially at the undergraduate level, to various disciplines” (Yash Pal, 2009, p. 21) Interdisciplinarity is a fundamental operating assumption for the modern university, its management, and faculty. National Education Policy 2020 is an important policy document that provides the vision of the government for modernizing education in India. Multidisciplinary education is of utmost priority in achieving modernization. Towards achieving multidisciplinary education, NEP 2020 makes the following recommendations:

1. **Institutional Restructuring:** Presently universities impart postgraduate education (second degree) in university departments and affiliate large number of colleges, majority of them impart first degree undergraduate education.

Affiliated colleges impart education limited to few disciplines, and many a times single discipline. Affiliating system leads to postgraduate – undergraduate divide and discourages multidisciplinary. From the point of governance and quality affiliating system is not favoured by various commissions and committees (Government of India, 2005, and Yashpal, 2009). NEP 2020 suggests the abolition of large affiliating system of higher education. NEP 2020 notes that “Moving to large multidisciplinary universities and HEI clusters is thus the highest recommendation of this policy regarding the structure of higher education” (Ministry of Education, 2020, p. 34). Three typologies are suggested in a move to restructuring higher education. Research intensive multidisciplinary university, teaching intensive multidisciplinary university and

autonomous degree granting multidisciplinary institution. NEP 2020 further notes that Model public universities for holistic and multidisciplinary education, at par with IITs, IIMs, etc., called MERUs (Multidisciplinary Education and Research Universities) will be set up. They will help set the highest standards for multidisciplinary education across India.

2. Curriculum Restructuring: NEP 2020 notes that “Multidisciplinary education ... shall be, in the long term, the approach of all undergraduate programmes, including those in professional, technical, and vocational disciplines” (ibid. p.36). Policy recommends that there will be further integration of science, vocational subjects and skill with the arts and humanities. In order to achieve above, imaginative and flexible curricular structure shall be promoted with creative combinations of disciplines for study.

Besides the increasing possibility of multiple entry and exit points shall create conditions for lifelong learning. This will create a good connect of university with the labor market.

3. High Quality Teaching and Research: Multidisciplinary universities and colleges shall promote multidisciplinary research at graduate level, master's and doctoral education. It will facilitate quality teaching achieving holistic education and specialized education. Teaching pedagogy will have an increased emphasis on communication, discussion, debate, research, and opportunities for cross-disciplinary and interdisciplinary thinking.

There is a vast claim of multidisciplinary education in NEP 2020. It will stimulate higher education environment. It will promote holistic education. It will



encourage community engagement. It will lead to value-based education. It will promote global citizenship education. Multidisciplinarity shall be oriented towards solving the problems of society. However, the question arises: at the practical level,

what shall be the implementation strategies? The state funding, incentive system and motivation of teachers shall remain some of the challenging issues in achieving large scale multidisciplinary education.

Curricular reform introducing multi-disciplinary teaching has also been practiced on the initiatives of university departments and colleges.

Multidisciplinary Approach and Curriculum

There have been two important curricular reforms introduced by the University Grants Commission. The first reform began in 2008 when it directed all central, state and deemed universities in the country to adopt a semester-based system and to introduce the credit-based courses. UGC set up Gnanam Committee which gave its report in 2009 which recommended for an action plan for academic reforms which included: a) Semester system; b) Choice-based credit system; c) Curriculum development; d) Admission procedures; and e) Examination reforms (University Grants Commission, 2009). Subsequently UGC issued guidelines in 2015 for choice-based credit system (University Grants Commission, 2015). CBCS allows students to choose inter-disciplinary, intra-disciplinary courses, skill-oriented papers (even from other disciplines according to their learning needs, interests and aptitude). As per the guidelines of UGC, a core course is a compulsory requirement of course in specialized discipline. An elective course has two components – elective within discipline and generic electives which allows for interdisciplinary course selection

by student. Elective also allows for a project work to acquire skill or knowledge in specialized area of interest. Besides, there is a third element of skill enhancement course. An undergraduate degree with Honors in a discipline may be awarded if a student completes 14 core papers in that discipline, 2 Ability Enhancement Compulsory Courses (AECC), minimum 2 Skill Enhancement Courses (SEC) and 4 papers each from a list of Discipline Specific Elective and Generic Elective papers respectively. Curriculum suggested in UGC guidelines followed by universities and colleges in India at the undergraduate level allows for interdisciplinary teaching.

Another curricular reform by UGC is based on a learning outcomes-based curriculum framework. It mentions both disciplinary and interdisciplinary learning outcomes. For example, in case of Chemistry it mentions sub fields such as life, environmental and material sciences. Synthesis and applied learning outcomes are important in the case of interdisciplinary education. Curricular reform related to outcome-based education is beginning to be discussed in universities. Its full implementation

will promote applied aspect of multidisciplinary education.

Curricular reform introducing multidisciplinary teaching has also been practiced on the initiatives of university departments and colleges.

However, in majority of cases, it has been practiced to make curricula employment oriented. In some lead universities, research collaboration has been active involving participants from various disciplines.

Multidisciplinary Teaching and Research

Interdisciplinary research-based teaching is a novel way to engage students to think rather than understand existing body of knowledge (Ribéreau-Gayon and David d'Avray, 2018). Interdisciplinary teaching and research requires a team that gathers information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines. Its purpose is to solve problems whose solutions are beyond the scope of a single discipline or area of research practice. Interdisciplinary teaching and research is more productive than multidisciplinary teaching and research as former leads to the integration and fusion of knowledge whereas the latter may not (Young, 1995). It would be interesting to look at the Indian scenario for the promotion of multidisciplinary teaching and research.

Indian Council of Social Science Research (ICSSR) promotes research in social sciences under

two categories of research projects. First, Major and Minor Research Projects and secondly Research Programmes, formerly known as Research Projects Responsive and Research Projects Sponsored respectively. Among other objectives of research programme, disciplinary research as well as collaborative, multidisciplinary research activities are noted.

Indian Institute of Science promotes interdisciplinarity through a specific division of interdisciplinary sciences. Specific research areas are: Bioengineering, Urban



The ISLS is constituted of the existing Departments of Biochemistry, Botany, Molecular & Human Genetics, Zoology and School of Biotechnology.

Infrastructure and Transportation, Nanoscale Materials, Nano Devices and Systems, Economics, Finance, Human Resource Management, Marketing, Optimization, Public Policy, Energy, Water, Internet of Things, Distributed Sensing, Computer Systems, Computational Science, Data Sciences and Bioinformatics.

Transdisciplinary Research Cluster was established in October 2013 in Jawaharlal Nehru University to plan the University's teaching and research to fulfil the vision of university of innovation and social change and to promote interdisciplinary research in areas such as disaster research, energy, silk road and cognitive sciences, sustainability studies, history and philosophy of science, natural disasters and development, international migration and diaspora studies, language technology, non-invasive molecular imaging, pluralist health care: knowledge, technology, practice and policy.

Jadavpur University has Interdisciplinary Studies, Law and Management and various centres of studies which offer programmes of teaching and research. DST Centre for Interdisciplinary Mathematical Sciences was formed in 2007 in BHU with the active cooperation from the Departments of Mathematics, Statistics, Computer Science, and Applied Mathematics of the university. The DBT-BHU Interdisciplinary School of Life Sciences (ISLS) was established in 2009 in the Faculty of Science under

an initiative of the Department of Biotechnology, Ministry of Science & Technology, Government of India. Its objective is to foster and promote interdisciplinary and interactive research among the faculty members, especially of life science departments. The ISLS is constituted of the existing Departments of Biochemistry, Botany, Molecular & Human Genetics, Zoology and School of Biotechnology. It has collaboration with the Institute of Medical Sciences, Institute of Agricultural Sciences, Institute of Environment & Sustainable Development in BHU and with the Indian Institute of Technology (BHU).

Delhi university has interdisciplinary centers such as Centre for Interdisciplinary Studies of Mountain and Hill Environment, Centre for Science Education & Communication, Centre for Global Studies, Women Studies & Development Centre, Dr. B.R. Ambedkar Center for Biomedical Research, Cluster Innovation Centre.

A sample of the list of interdisciplinary research and, in some cases, teaching centres present a glimpse of a movement of interdisciplinarity in Indian higher education. The author has not gone into analysing the teaching and research functions performed by the centres in interdisciplinary areas. Hence it is difficult to know the fusion of knowledge across various disciplines. However, it is important to note that universities in India are promoting teaching and research in interdisciplinary areas.

Establishing Multidisciplinary University

There are many challenges in the implementation of NEP 2020 for establishing multidisciplinary university. First, almost all affiliating universities in India have large number of colleges which are single discipline colleges. For example, medical college, engineering college, education college, etc. It is a huge task to convert them into multi-disciplinary college. These institutions are government owned and private. It may be difficult to convince private managed colleges to add new departments and recruit additional teachers. The author estimated the additional cost of adding departments, teachers and infrastructure for the top 50 National Institutional Ranking Framework (NIRF) ranked colleges based on certain norm of model multidisciplinary college. Rs. 2500 million per college in the next 10 years would be additional cost.

Neither government nor private management will be ready to invest money of such a high order. Many state, private and deemed universities and institutions of national importance are single discipline universities. To restructure them into multidisciplinary universities would also amount to large investment. In fact, there are many non-viable colleges in rural areas. They may have to be closed down. Under above circumstances, there may be a very small group of colleges and universities which can be restructured into multidisciplinary institution. However, so far as curricular change is concerned there have been government initiatives to add multidisciplinary centres/ departments in existing central and state universities. These initiatives need to be promoted. Besides, multidisciplinary teaching and research also may be promoted.

Conclusion

Multidisciplinary in higher education revolutionises knowledge through the interactions of disciplinary knowledge and is helpful to solve problems in society. Since 1970s multidisciplinary centres and departments were established. Curricular changes allowed multidisciplinary education. Choice based credit system offered students the choices to study specialization based on disciplines as well as the option to study

subjects from other disciplines. The recent initiative of multidisciplinary education of the government of India, contained in NEP 2020, is important. There are challenges of institutional restructuring as large investment is required for a single discipline institution to convert into multidisciplinary institution. However, partially the curricular restructuring will enable multidisciplinary teaching in Indian higher education.

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