

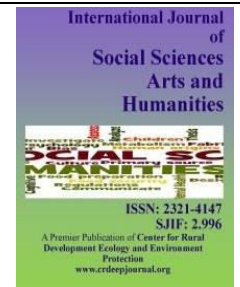
Vol. 7. No. 3. 2019.

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Contents available at:

www.crdeepjournal.org

International Journal of Social Sciences Arts & Humanities (ISSN: 2321-4147)



Review Paper

Development of Higher Education in Mizoram with Special Reference to Science: A Review

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ARTICLE INFORMATION

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Article history:

Received: 16-12-2019
Revised: 18-12-2019
Accepted: 25-12-2019
Published: 27-12-2019

Key words:

Higher education,
Science education,
Development,
Undergraduate, Post-graduate

ABSTRACT

This paper entitled "Development of Higher Education in Mizoram with Special Reference to Science: A Review" aimed at assessing the development of general higher education in Mizoram with special focus on science education. The universe of the study consisted of the Mizoram University and its 27 affiliated colleges of general education. The analytical method was adopted, in which the analysis was made on the basis of published and unpublished documents of the concerned institutions and official records of the Directorate of Higher and Technical Education, Government of Mizoram, Aizawl. The findings of the study were: (i) the development of higher education in science at the undergraduate level was slow and inadequate, (ii) the enrolment of students in science at the undergraduate level was very low in comparison to arts stream, (iii) there was lack of science teachers in majority of the state government colleges, (iv) there was imbalance distributions of general higher education in science not only in terms of regions/districts but also in terms of teachers, (v) considerable development in enrolment of students in science at the post-graduation level was found, and (vi) all the post-graduate departments of science seemed to have adequate number of teachers. It is high time for the Government of Mizoram to take up some appropriate measures for the quantitative as well as qualitative development of higher education in science at the undergraduate level in the State.

Introduction

Before the advent of the Christian missionaries there was no organized formal system of education in Mizoam. Education is the most important contribution of the missionaries. In Mizoram, the first Primary School was opened by Christian missionaries Rev. J.H. Lorrain and v8gxRev. F.W. Savidge on 2nd April, 1894 at Aizawl. The first Middle English School and the High School were started in 1905 and 1944 respectively at Aizawl. And after of a gap of 14 years, the birth of Higher education took place in the state with the establishment of a college at Aizawl in 1958. Although Mizoram was late starter in the field of general education, today, it has not only achieved the second highest literacy status but also made considerable progress at all levels of education. However, it appears that the state has made a little progress in the field of science education at the collegiate level in spite of the fact that the state Government has taken a lot of efforts to promote science education at the school level through its Science Promotion Wing created in 1973 by way of reorganizing and improving the science curriculum, methods of teaching, providing laboratory equipment, supplying science kits, introducing cash awards for meritorious students in science and

mathematics of primary, middle and high schools. Similarly, to attract more meritorious students in higher education in science, the Department of Science and Technology, Government of Mizoram also introduced a special scholarship called 'Mizoram Post Matric Merit Science Scholarship' for the undergraduate and post-graduate students.

In Mizoram, till date only a few research studies have been conducted in the field of science education which mainly confined to school stage. One such study was conducted by Zohmingliani (2011) for doctoral degree, in which it was reported that the average enrolment in science against the total enrolment at Higher Secondary School during 2006-2010 was 21% and Undergraduate level 2004-05 to 2009-10 was 7.68%. During the last nine years not even a single study has been carried out pertaining to the issues of science education in the state. The present problem is, therefore, significant as it aims at examining the development of higher education in Mizoram with special focus on science and suggesting appropriate measures for improvement. The study is expected to be of practical value to the educational planners and policy makers in formulating

policies, especially the one connected with science in the higher education.

Methodology

Altogether 28 institutions of higher education consisting of the Mizoram University itself and its 27 colleges of general education were involved in the study. The analytical method was adopted in the study, in which the sources of data were from the published and unpublished documents of the concerned institutions and official records of the Directorate of Higher and Technical Education, Government of Mizoram, Aizawl. The study concentrated on the assessment of the development of higher education in Mizoram which took place during the period 1958-2019, i.e., 61 years. The data were analyzed by using percentage.

The present paper is divided into three sections in which the first section deals with the historical development of higher education in Mizoram. The second section is concerned with science education at undergraduate level and the last section examines the development of science at the post-graduate level. Finally, certain conclusions are drawn in light of the results of the study and some suggestions were made for improvement.

Historical Development of Higher Education in Mizoram

Collegiate Education

The history of Higher Education in Mizoram is only six decades old. It can be traced back to 15th August, 1958 when the first college was established at Aijal, now Aizawl the capital of the state. It was founded as a purely private enterprise and managed by a group of Mizo elders. Initially, the classes were held at night. This enabled the enthusiastic Mizos working in offices and different walks of life to pursue higher studies. The first subjects taught in the college were Alternative English, Civics, Commercial Geography, English, History and Logic.

In the initial stage, when the wife of late Pachhunga came forward and donated a sum of Rs. 50,000.00 (rupees fifty thousand) only, the college took a new name of Pachhunga Memorial College. The college was recognized by Gauhati University, Assam, in 1960. The night classes were then shifted as regular day college and it was provincialized by the Assam

Government and renamed as Pachhunga Memorial Government College in 1965. The college was then affiliated to North Eastern Hill University (NEHU) in 1974 following its establishment in Shillong, the capital of Meghalaya in 1973. The college was upgraded as the constituent college of NEHU in 1979 and its name changed into Pachhunga University College (PUC).

Before the setting up of this college, only a few affluent parents used to send their children for higher education outside Mizoram in towns of neighboring states namely, Imphal, Shillong and Gauhati, and far-off cities namely, Calcutta, Delhi, Pune and Bangalore. But the absence of a college within the state meant denial of higher education to many of the students whose parents could not afford to send them colleges outside Mizoram. Therefore, the establishment of the Pachhunga Memorial College practically ushered in an era of higher education in Mizoram (Nath, 2003).

Higher education spread to the southern part of the state with the establishment of Lunglei College at Lunglei in 1964 which was also first affiliated to Gauhati University and then to NEHU (Sangkima, 2010). With the rapid increase of student population, there arose rising demand for higher education from other towns as well resulting in the setting up of Champhai and Serchhip colleges in 1971 and 1973 respectively. Another college named Aizawl College came up in the capital of Mizoram in 1975. Thereafter, the number of colleges increased rapidly in the state as more colleges were established in quick succession in Aizawl and at other small towns. The year 1980- 1993 showed a sharp increase in the number of colleges in the state. The number of colleges increased acutely from 9 in 1980 to 24 in 1993 as shown in Table –I. Today, there are altogether 36 colleges/institutions in the state affiliated to Mizoram University. Out of these, nine of them offer professional courses one each in computer, legal, medical, nursing, paramedical and nursing, and 4 in teacher education. The rest 27 colleges provide general education.

A profile of colleges/ institutions affiliated to Mizoram University till (2017-18) along with the year of establishment, nature of affiliation, UGC recognition and courses conducted is given in Table – I.

Table 1. Profile of Colleges/institutions affiliated to Mizoram University

SNo	Name of the College/Institution	Year of Estd.	Nature of Affiliation	UGC/AICTE Recognition	Courses conducted
1	Pachhunga University College, Aizawl	1958	Constituent	2(f) & 12 B	B.A. Core in Eng, Mizo, Eco, Edn, Geog, Hist, Phil, Pol.Sc., Psy, Pub.Admn, Socio, B.Sc. Core in Phy, Chem, Maths, Bot, Zool, Geol, Statis, Env.Studies, Elective in Bio-tech , B. Com, Diploma in Pisciculture
2	Lunglei Govt. College, Lunglei	1964	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Env Studies, Geog, Hist, Phil, Pol Sc., B.Sc. Core in Phy, Chem, Maths, Bot, Zool, Geology
3	Govt. Champhai College, Camphai	1971	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc. B. Sc. Core in Phy, Chem, Maths, Bot, Zool, BCA
4	Govt .Serchhip College,	1973	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog,

	Serchhip				Hist, Pol Sc. B.Sc. Core in Phy, Chem, Maths, Bot, Zool , BCA
5	Govt. Aizawl College, Aizawl	1975	Permanent	2(f) & 12 B	Core in Eng, Mizo, Eco, Edn, Hindi, Hist, Pol Sc, Socio, B. Com.
6	Institute of Advanced Study in Education, (CTE), Aizawl	1975	Permanent	2(f) & 12 B	B.Ed., M. Ed. B. Ed. Multimode
7	Govt. Saiha College, Siaha	1978	Permanent	2(f) & 12 B	Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc., Socio
8	Govt. Kolasib College, Kolasib	1978	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc. Pub Adm. B.Sc. Core in Phy, Chem, Maths, Bot, Zool , BCA
9	Govt. Hnathial College, Hnathial	1979	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc.
10	Govt. Hrangbana College, Aizawl	1980	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc., Psy, Pub Adm., B.Com
11	Govt. Lawngtlai College, Lawngtlai	1980	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Socio, Pol Sc., Pub Adm., Env Studies
12	Govt. Zirtiri Residential Science College, Aizawl	1980	Permanent	2(f) & 12 B	B.Sc. Core in Phy, Chem Maths, Bot, Zool, Biochem, Geol, Electronics , BCA, Home Sc.
13	Govt. Mamit College, Mamit	1983	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc.
14	Govt. J. Buana College, Lunglei	1983	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc., Pub Adm.
15	Govt. Mizoram Law College, Aizawl	1983	Permanent	2(f) & 12 B	L.L.B.
16	Govt. Saitual College, Saitual	1884	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc., Pub Adm.
17	Govt. Khawzawl College, Khawzawl	1985	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc.
18	Govt. Zawlnuam College, Zawlnuam	1986	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc.
19	Govt. Aizawl North College, Aizawl	1988	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Geog, Hist, Pol Sc.
20	Govt. Aizawl West College, Aizawl	1990	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc., Psy, Pub Adm.
	Govt. T. Romana College, Aizawl	1992	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc., Pub Adm., Socio
22	Govt. J. Thankima College Aizawl	1992	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Eco, Edn, Hist, Pol Sc.,
23	Govt. Kamalanagar College, Chawngte	1992	Permanent	2(f) & 12 B	BA Core in Eng, Mizo, Hindi, Eco, Edn, Hist, Pol Sc., Pub Adm.,
24	Govt. Johnson College, Aizawl	1993	Permanent	2(f) & 12 B	B.A. Core in English, Eco, Mizo, Hist, Pol.Sc., Edn., Environmental Studies
25	Regional Institute of Paramedical & Nursing Sciences (RIPANS), Zemabawk, Aizawl	1996	Permanent	2(f) & 12 B	B.Sc. Nursing, B. Pham., B.Sc. MLT, B.Sc. RIT, B.Sc. BOOT, M. Pham.
26	National Institute of Electronics & Information Technology, Aizawl	2001	Permanent	AICTE	BCA, MCA, Diploma in Electronics & Telecommunication Engg (DETE), Diploma in Computer Science & Engg (DSCE)
27	Mizoram Nursing College, Civil Hospital, Aizawl	2005	Provisional	-	B.Sc. Nursing
28	Higher & Technical Education of Mizoram (HATIM), Lunglei	2008	Provisional	2(f) & 12 B	BCA, BSW, B. Com., BA Core in Eng/Elective in Mizo, Eco., Hist, Philosophy
39	Aizawl City College,	2015	Provisional	-	B.A. Core in English, Mizo, History,

30	Aizawl Divine Mercy College, Aizawl	2016	Provisional	-	Pol. Sc. Education and Sociology B.A. Core in English, Mizo, History, Pol. Sc., Geography, Education, Economics, Bachelor of Social Works
31	St. Xavier's College, Lengpui	2017	Provisional	-	B.A. Core in English, Mizo, History, Sociology, Pol. Sc., Psychology, Edn., B.Com.
32	Helen Lowry College, Aizawl	2017	Provisional	-	B.A. Core in English, Education, Sociology or History, Pol. Sc., and Economics or Public Administration, B. Com.
33	DIET, Aizawl	2018	Provisional	-	B.Ed.
34	DIET, Lunglei	2018	Provisional	-	B.Ed.
35	SCERT, Aizawl	2018	Provisional	-	B.Ed. Special Education (Hearing Impairment & Visual Impairment)
36	Zoram Medical College, Falkawn	2018	Provisional	-	MBBS

Source: Mizoram University Annual Report: 2017-18

Apart from these, the state has a College of Veterinary Sciences and Animal Husbandry (CVS & AH) at Selesih, North Aizawl, National Institute of Electronics and Information Technology, Aizawl, National Institute of Technology, Aizawl, Mizoram Engineering College, Lunglei and two Polytechnic institutes at Aizawl and Lunglei. Thus, there are now various opportunities including business, engineering, law, management, medicine, nursing and other career oriented courses.

Post- Graduate Education

The higher education focused more on the undergraduate courses during the first two decades and students were compelled to go out of the state for post-graduate education. This led to the establishment of a university within the state. Several demands were made, but this was partly fulfilled when a campus of the North Eastern Hill University (NEHU), Shillong was opened at Aizawl in 1979 with the departments of Economics, Education and English. At the beginning, one Officer on Special Duty, afterwards re-designated as Deputy Registrar and his supporting staff looked after the University Campus at Aizawl. The campus was upgraded and the Pro-Vice Chancellor post was created in 1982. Indeed, this is an important milestone in the progress of higher education in Mizoram (Hluna, 1992).

The Departments of Psychology and Public Administration were started in 1983 and 1985 respectively. Later, the other departments, namely Forestry and Social Work were initiated in 1990 and 1997 respectively. The Department of Social Work, however, started its course from 2002 that is only after the formation of the full-fledged Mizoram University.

The post-graduate education and research has been further widened in Mizoram with the existence of much awaited Mizoram University. The NEHU's Mizoram Campus at Aizawl was converted into a full-fledged central university called 'Mizoram University' established by an act of Parliament on 25th April, 2000 and started functioning from 2nd July, 2001. With the formation of Mizoram University, the aspiration of the people of Mizoram to have a university of its own was fulfilled. Initially, the University was offering post-graduate education and research only in seven subjects inherited from NEHU. Now, it offers post-graduate studies and research in 33 academic departments of 8 different schools. The details of which were presented in Table

Table 2. Different Schools and Academic Departments of Mizoram University

S.No	Name of School	Name of Department
1	School of Earth Sciences & Natural Resource Management (SES & NRM)	Department of Environmental Science Department of Extension Education & Rural Development Department of Forestry Department of Geography & Resource Management Department of Geology Department of Horticulture, Aromatic & Medicinal Plants
2	School of Economics, Management & Information Sciences (SEMIS)	Department of Commerce Department of Economics Department of Library & Information Science Department of Management Department of Mass Communication
3	School of Education & Humanities (SEH)	Department of Education Department of English Department of Hindi

4	School of Engineering & Technology(SET)	Department of Mizo
		Department of Civil Engineering
		Department of Computer Engineering
		Department of Electronic & Communication Engineering
5	School of Fine Arts, Architecture & Fashion Technology(SFAA&FT)	Department of Electrical Engineering
		Department of Information Technology
6	School of Life Sciences(SLS)	Department of Planning & Architecture
7	School of Physical Sciences(PS)	Department of Biotechnology
		Department of Botany
		Department of Zoology
8	School of Social Sciences(SSS)	Department of Chemistry
		Department of Mathematics & Computer Science
		Department of Physics
		Department of History & Ethnography
		Department of Political Science
		Department of Public Administration
		Department of Psychology
		Department of Social Work
		Department of Sociology

Besides Mizoram University, the state also has a university called the Institute of Chartered Financial Analysis of India (ICFAI) University established by an Act of the State Legislative Assembly of Mizoram in 2006, which offers a couple of professional as well as general courses both at undergraduate and post-graduate levels.

Science Education at Undergraduate Level

Science education at undergraduate level in Mizoram had a late start. The teaching of science in the colleges of Mizoram is only four and half decades old. It was in 1973 when science teaching was introduced in Pachhunga University College, Aizawl and Lunglei College, Lunglei at Pre- University level. Five years later in 1978-79 the teaching of science at undergraduate level was started in Pachhunga University College. This college

continued to be the only college teaching in science stream in the state at this level for another thirteen years (Wangu, 1995). In fact, it took twenty long years from 1958-1978 to open science at the undergraduate level in the state. The second and the third colleges which started teaching of science at undergraduate level were Lunglei College and Kolasib College in 1991 and 1992 respectively. Government Zirtiri Residential Science College (GZRSC), Aizawl, is the only science college in Mizoram. However, apart from this, there are 5 other colleges where science is taught along with Arts or Commerce streams. Thus, at present, out of 27 colleges/institutes imparting general education, 6 of them are offering science education at undergraduate level including a constituent college of Mizoram University popularly known as PUC (Table III).

Table 3. Year of Starting Undergraduate Science Stream/College in Mizoram

Name of the College	Year of Starting Science Stream/College
Pachhunga University College(PUC), Aizawl	1978-79
Govt. Lunglei College(GLC), Lunglei	1991-92
Govt. Kolasib College(GKC), Kolasib	1992-93
Govt. Champhai College(GCC), Champhai	1995-96
Govt. Zirtiri Residential Science College(GZRSC), Aizawl	2000-01
Govt. Serchhip College(GSC) Serchhip	2004-05

Source: Directorate of Higher and Technical Education, Govt. of Mizoram, Aizawl.

It is evident from the above table that there has been very slow and gradual growth in the number of colleges offering general science education at the undergraduate level over the past 26 (1978-79 to 2004-2005) years. Thereafter, there has been not only complete halt in opening new science college but also in introducing science courses in the existing colleges of the state. It is a very disturbing situation that not even a single college in the

state has opened science stream during the last fifteen years, that is, from 2004-2005 till date (i.e., 2019) (Table III). In its totality, it can be concluded that the pace of progress of science education in the state seems to lose its momentum and this is indeed not a healthy sign for the future of higher education in science in Mizoram. The number of colleges offering general science education in the state is just 22.22% of the total number of 27

colleges. This figure is very low in comparison to the number of colleges offering science education of its neighbouring states, say, Manipur which stands at 72.37%. (Manipur University Annual Report 2017-2018). Furthermore, out of the six colleges providing science education in the state, two are located at Aizawl and one each at Champhai, Kolasib, Lunglei and Serchhip Districts, whereas six districts namely, Siahia (one of the oldest districts in Mizoram) Hnathial, Khawzawl, Lawngltai, Mamit and Saitual do not have any facilities for higher education in science. This indicates not only the imbalance distributions of general higher education in science but also unplanned development of science education in the state. This is one serious set-back for higher education system of Mizoram.

Development of Enrolment in Science

Science education at the undergraduate level in Mizoram was introduced in 1978-79 in Pachhunga University College with an intake of 25 students which rose to 136 in 1990-91. In the following year, that is 1991-92, with the opening of science stream in Lunglei College, the number of students increased to 196. The number was further increased to 277 with the starting of science stream in another college namely, Kolasib College in 1992-93. Table- IV (A) and (B) below show the details of enrolment of undergraduate students of **Pass** and **Honours** courses in science from 2004 - 05 to 2010 - 11 and Semester Courses from 2011-12 to 2018-19 at the six colleges of the state.

Table 4 (a). Enrolment of Undergraduate Students in Pass and Honours Courses during 2004-05-2010-11

Year	2004-2005		2005-2006		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011	
	Pass	Hons	Pass	Hons	Pass	Hons	Pass	Hons	Pass	Hons	Pass	Hons	Pass	Hons
Name of College														
PUC	10	148	26	238	12	380	35	503	15	456	36	307	29	392
GLC	-	13	3	38	4	43	-	65	-	57	4	43	9	80
GKC	2	25	-	29	1	32	3	35	3	23	3	17	13	17
GCC	2	7	1	7	-	14	19	17	-	23	16	16	2	16
GZRSC	-	-	6	156	10	215	9	221	117	236	13	228	2	277
GSC	-	4	3	15	4	21	5	18	3	15	-	11	2	23
	14	197	39	483	31	705	71	865	138	810	72	622	57	805
Total	211		522		736		936		948		694		862	

Sources: (i) Directorate of Higher & Technical Education, Govt. of Mizoram, (ii) Mizoram University Annual Reports: 2005-06 to 2010-11, (iii) Individual Colleges

Table 4 (b). Enrolment of Undergraduate Students in Semester Course

Name of College	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
PUC	504	622	667	341	401	403	386	877
GLC	97	130	138	169	206	188	166	166
GKC	19	39	35	53	62	61	45	50
GCC	31	34	57	80	91	83	71	48
GZRSC	331	368	355	405	422	436	460	563
GSC	25	43	58	73	85	90	68	66
Total	1007	1236	1310	1121	1267	1261	1196	1770

Sources: (i) Directorate of Higher & Technical Education, Govt. of Mizoram, Aizawl, (ii) Mizoram University Annual Reports: 2011-12 to 2013-14, (iii) Individual Colleges

A look at the Table IV-A unfolds that in all these years 2004-05 to 2010-11, the number of students enrolled in honours course was much higher than pass course in science stream. This is a healthy sign as it shows that students have vision for higher studies in science. Further, there has been a phenomenal growth

in the enrolment of students in science from 211 in 2004-05 to 522, 736 and 936 in 2005- 06, 2006-07 and 2007-08 respectively. The enrolment record of 2008-09 however, shows only a slight increase in the number of students. And in the following year there was a sharp decline in the enrolment of students to 694 but

in 2010-11, the colleges regained and administered an increased enrolment. Interestingly, similar trend was observed after the introduction of semester system in the colleges of the state in 2011- 12 and it continued to grow till 2013-14. However, in the following year there was a stiff fall in the enrolment but increased in 2015-16 (Table- IV, B). The year 2016-17 again showed a marginal deep in enrolment of students but it was more in 2017-18. A sudden rise in enrolment in science was, however, recorded in the year 2018-19. According to Mizoram University Annual Report (2011-12), a total of 12,022 students were enrolled in undergraduate colleges of the state. Out of this, 10255, 1007 and 760 were in Arts, Science and Commerce respectively which means that science forms only 8.38% of the enrolment of students against the 85.30% enrolment in arts. This is indeed very low in comparison to the enrolment of students in arts. Further, as per the enrolment data of Directorate of Higher and Technical Education, Mizoram for 2017-18, out of a total of 15,453 students enrolled (arts, commerce and science) in 27 colleges offering general education, 1196 students were in science which accounts for 7.74% of total enrolment only, 0.64% fall from the enrolment record of 2011-12. However, according

to enrolment data available from the Directorate of Higher and Technical Education, Mizoram for the year 2018-19, a total of 15526 students were enrolled of which 13011 in arts, 1770 in science and 749 in commerce. A close observation of the data reveals that science constitutes 11.40% of the total enrolment, a 3.66% rise from the enrolment of 2017-18, which is obviously a very positive sign.

Development in the number of Science Teachers

In 1978, when the undergraduate science was introduced in PUC, there were only 7 teachers. With the increase in the number of colleges offering general science education and establishment of a science college in the state, the number of science teachers rose to 109 in 2008-09. As per the records available from the colleges, the total number of science teachers increased to 166 in 2018-19 of which 130 are regular, 15 contractual and 21 part-time. However, engagement of faculty members on contractual and part-time basis shows that the system still faces problem of shortage of teachers. Table V below shows the status of science teachers in the colleges of Mizoram.

Table 5. Status of Science Teachers in Colleges

Name o of College	Phy			Chem			Bot			Zool			Maths			Biotec			Bioche			Geol			Evs			Statis			Electro		
	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P
PUC	7	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LGC	3	1	-	4	-	1	3	1	-	5	-	-	1	1	1	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
GKC	2	1	1	4	-	-	3	-	1	4	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GCC	3	-	1	2	1	1	2	1	2	2	1	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GZRSC	5	-	-	5	-	-	7	-	-	6	-	-	3	2	-	-	-	-	3	-	1	1	3	-	-	-	-	-	-	-	-	-	3
GSC	2	-	2	1	1	-	2	-	2	3	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: R= Regular, C= Contract, P= Part-time
Source: Individual colleges

The data presented in Table V show that PUC, the only constituent college of Mizoram University is found to have adequate number of teachers in almost all departments of science except statistics. On the other hand, as far as state government colleges are concerned, they are in lamentable situation. Even the state’s only science college (GZRSC) which was established with an objective to improve science education in the state does not have adequate number of regular teachers in some of the departments. The college has as many as 5 contractual and 4 part-time teachers. Interestingly, the department of Electronics is manned by 3 part-time teachers. Similarly, Lunglei college, the second oldest as well as the only college offering science education in the southern part of the state does not have the required number of teachers. The situation is even more alarming in the rest of the colleges. Taking into consideration of the above facts, it can be mentioned that the present status of science

education in the state is not impressive. The state government has to do a lot for the improvement of science education in the state.

Science Education at Post-graduate Level

The post-graduate education in science in Mizoram is only two and a half decade old which started with the opening of the Department of Forestry in 1990 under NEHU, Mizoram Campus. The department, however, started its M. Sc. Programme in the year 1992 with intake capacity of only 6 (six) students which has now been increased to 30. It started its Ph. D. programme in the year 1997. The Departments of Geology and Environmental Sciences (formerly Department of Forest Ecology, Biodiversity and Environmental Science) were opened in May and July respectively, 2002 after the establishment of Mizoram University in 2001 with intake capacity of 10 students each. The Ph. D. programme in the department of Geology was started in the year

2003. The intake capacity of the department has been raised to 20, 25 and 30 in 2009, 2010 and 2014 respectively. The Department of Environmental Science started its Ph. D. programme in 2005. The intake capacity of the department has also been increased to 15, 20 and 25 in 2007, 2010 and 2011 respectively. The Department of Physics was started in Mizoram University in August, 2003, under the School of Physical Sciences with intake capacity of 10 students which was then gradually increased to 15, 20, 25 and 30 in 2007, 2010, 2012 and 2013 respectively. It started its Ph. D. programme in 2007. The Departments of Zoology and Botany under the Schools of Life Sciences were initiated in February and March 2005 respectively with intake capacity of 10 seats each, while the classes of both the faculties began only in August, 2006. Both the departments have started offering Ph. D. programme in 2007. The student intake capacity of the departments was raised to 20 and 30 each in 2008 and 2014 respectively. The Department of Chemistry was opened in August 2006 with intake capacity of 10 students. In 2007, the department not only raised the intake capacity to 20 students but also introduced the Ph. D. programme. The intake capacity was further increased to 25 and 30 in 2012 and 2016

respectively. The Department of Mathematics and Computer Science came into existence in the year 2006. However, the classes started from July 2007 with intake capacity of 20 seats. The intake capacity of the department was raised to 25 and 30 in 2011 and 2014 respectively. It started its Ph. D. programme from the academic session 2008-2009. The Department of Biotechnology was introduced in August, 2007 with 15 (fifteen) students making altogether 3 (three) departments under the School of Life Sciences. The actual intake capacity of the department was, however 20 students. It started its Ph. D. programme from the academic session 2008 – 09. The intake capacity of the department was increased to 25 and 30 in 2014 and 2017 respectively. The Department of Horticulture, Aromatic and Medicinal Plants (HAMP) was established in July, 2007 with an intake capacity of only 10 students per academic session which was then raised to 20, 25 and 30 in 2008, 2012 and 2017 respectively. It started its Ph. D. programme in the following year itself. The table below shows the enrolment of students in different post-graduate departments of science in Mizoram University during 2007-08 to 2017- 18.

Table 6. Enrolment of students in different Post-graduate Departments of Science

Name of Dept	2007- 2008	2008- 2009	2009- 2010	2010- 2011	2011- 2012	2012- 2013	2013- 2014	2014- 2015	2015- 2016	2016- 2017	2017- 2018
Biotechnology		24	24	30	30	26	31	41	49	47	48
	16										
Botany	13	13	21	27	26	23	30	46	58	57	57
Chemistry	18	23	27	20	18	20	30	51	56	68	59
Environmental Sciences	8	15	23	31	19	16	23	28	40	47	47
Forestry		16	23	30	28	23	26	40	54	58	58
	14										
Geology	4	7	20	26	31	37	33	50	61	57	59
Horticulture, Aromatic & Medicinal Plants	9	14	18	9	7	15	22	26	37	47	47
Mathematics & Computer Science	7	14	16	30	29	25	35	55	59	62	69
Physics	11	16	28	27	41	40	41	53	55	60	59
Zoology	12	17	21	25	23	28	32	45	58	57	55
Total	112	159	221	252	252	253	303	435	527	560	558

With the increase in the intake capacity of various departments of science, the number of students showed a phenomenal growth from just 112 in 2007-08 to 558 in 2017-18. This clearly showed that the state is progressing well in science at this level. A close observation of the data revealed a very interesting fact that during the last three to four years there has been tremendous increase in enrolment even in the Departments of Physical sciences which were considered as difficult subjects by majority of the Mizo students. This is truly a very positive development.

Development in the Number of Teachers

Before the establishment of Mizoram University only Forestry was available as science subject under NEHU campus, Aizawl. The rest of the science departments were opened after the existence of Mizoram University. In the initial stage almost all the science departments were taken care of by a few faculty members. However, in due course of time, with the opening of new departments of science in the University, more and more teachers were recruited over the past years. As a result, the number of teachers rose considerably. Details of the faculty positions of various departments of science in Mizoram University in 2007-08 and 2017-18 were presented in Table VI.

Table 7. Faculty Positions in Different Departments of Science

Name of Department	Faculty positions in 2007-08	Faculty positions in 2017-18
Biotechnology	5	6
Botany	5	7
Chemistry	5	8
Environmental Science	6	8
Forestry	5	9
Geology	5	7
Horticulture, Aromatic & Medical Plants	4	7
Mathematics & Computer Science	4	6
Physics	5	7
Zoology	5	7
Total	49	72

Source: Mizoram University Annual Reports: 2007-08 and 2017-18

It is evident from Table VI that there had been considerable growth in the number of teachers from 49 in 2007-08 to 72 in 2017-18, an increase of 23 teachers. The present faculty position of all the departments was expected to manage the required manpower.

Conclusion

The overall development of higher education in science particularly at undergraduate level in the state is not only slow but also imbalanced. Out of 27 colleges imparting general education, science stream is available only in six colleges and that too including a constituent college of Mizoram University. Science education at the undergraduate level is accessible only to five districts out of eleven. It has not seen remarkable change in terms of enrolment. As already stated, according to data available from the Directorate of Higher & Technical Education, Mizoram for the year 2018-19, science constitutes only 11.40% of the total enrolment, the second highest ever, the first highest being 11.46% in 2007-08. This percentage is, however, very low in comparison to arts stream. Majority of the colleges managed by state government suffer from lack of teachers.

Taking into account the results of the study, it may be inferred that:

- (i) The development of higher education in science at the undergraduate level was slow and inadequate.
- (ii) The enrolment of students in science at the undergraduate level was very low in comparison to arts stream.
- (iii) There was lack of science teachers in majority of the state government colleges.
- (iv) There was imbalance in distributions of general higher education in science not only in terms of regions/districts but also in terms of teachers.
- (v) considerable development in enrolment in science at the post-graduate level was found.
- (vi) all the post-graduate departments of science seemed to have adequate number of teachers.

In fine, it is strongly felt that it is high time for the State Government to take up some appropriate measures for the quantitative as well as qualitative development of higher education in Science at the undergraduate level in the State.

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