



Development and Status of Higher Education in Science in Mizoram

Thokchom Budha Singh
Govt. Saiha College, Mizoram

Abstract

This paper is an attempt to examine the development and status of higher education in science in Mizoram. Mizoram University and its 28 affiliated colleges or institutes offering general education comprised of the study. Descriptive research was employed in the study, in which the analysis was made on the basis of science teacher interviews, published and unpublished documents of the concerned institutions and official records of the Directorate of Higher and Technical Education, Government of Mizoram. The findings emerged from the study are – (i) the development of higher education in science at the undergraduate level was not only slow but also imbalance, (ii) enrolment of students in science in the state government colleges was low, (iii) there was lack of science teachers in majority of the state government colleges, (iv) majority of the teachers of state government colleges expressed their laboratory facilities as average level, (v) majority of the science teachers of state government colleges revealed that prescribed books are adequately available in their libraries, while the science teachers of University's only constituent college expressed their library facilities as very good, (vi) there has been a considerable development in enrolment of post-graduate science students and enrolment has also been made as per the intake of students, and (vii) all the post-graduate departments of science of Mizoram University were found to have adequate number of teachers.

It may be suggested that the concerned authority takes up appropriate measures for the development of higher education in science at the undergraduate level in the state.

Keywords: *Development, Status, Higher Education, Science, Mizoram.*

INTRODUCTION

There was no formal education in Mizoram before the arrival of the Christian missionaries. The formal education was introduced in the state by two Christian missionaries namely Rev. J.H. Lorrain and Rev. F.W. Savidge by opening a Primary School on 2nd April, 1894 at Aizawl. The first Middle English School was started in 1905 at Aizawl. And after a gap of 39 years, the birth of secondary school took place in the state with the opening of a High School at Aizawl in 1944. And again another 14 years later, Higher education was started in Mizoram with the establishment of a college at Aizawl named 'Aizawl Evening College', now popularly known as PUC (Pachhunga University College) on August 15, 1958. Although Mizoram was late starter in the field of education, today, it has not only achieved the status of one of the highest literate states in the country but also made considerable progress at all levels of education. Today, the state has 36 affiliated/constituent colleges or institutes and two universities of which one is private. However, it is observed that the state is lagging behind in the field of science education at the collegiate level in particular.

Mizoram had all along been very backward in Science and Technical education, and a big stride has been taken in this respect. The Science Promotion Wing has, with the collaboration of UNICEF and NCERT, translated and adapted a number of NCERT books and introduced in Primary and Middle Schools. Teachers of Primary, Middle and High School have been trained for more effective teaching with Science Kits which have been supplied to these schools. The Education Department, as a part of social drive of its own for the improvement of science education, initiated cash awards to the school students for proficiency in Science and Mathematics on the basis of their performances in the various examinations both internal and external. A number of High Schools have also been provided with Science Laboratories (Hluna, 1992). Similarly, to attract more meritorious students in higher education in science, the Mizoram Science, Technology and Innovative Council (MISTIC), established by the Government of Mizoram in 1985 and supported by Department of Science and Technology of the Central Government also introduced a special scholarship called 'Mizoram Post Matric Merit Science Scholarship' for the undergraduate and post-graduate students from the year 1988-89. All these, have made considerable improvement in science education in the state but still has a long way to go to catch up

with other states of the country. Undergraduate enrolment in science in the state forms only 11.40% of the total enrolment (Singh, 2019), which is much below the all India enrolment of 16% in science (AISHE, 2019-20).

Only a few research studies have been conducted in the field of science education in the state and were mainly confined to school education. Therefore, the present problem is significant as it attempts to examine the development and status of higher education in science in the state. The findings emerge from the study is expected to throw some light on the development and status of higher education in science and would be of practical value to the educational planners and policy makers in planning and formulating policies for higher education in science in the state.

Objectives

- (i) To study the development of higher education in Science in Mizoram.
- (ii) To study the status of higher education in Science in Mizoram.

Delimitations

The present problem was confined to Mizoram University and its 28 other affiliated/constituent colleges or institutions offering only general education.

Methodology

A total of 29 institutions of higher education consisting of Mizoram University and its only constituent college, and another 27 affiliated colleges or institutions offering only general education were purposely selected for the study. Descriptive research was employed in which the analysis was made on the basis of data collected from science teachers, published and unpublished documents of the concerned institutions and official records of the Directorate of Higher and Technical Education, Mizoram, AISHE Report and Annual Report of Manipur University, Imphal.

Science Education at the Undergraduate Level in Mizoram

In Mizoram, Science education at the undergraduate level had a late start. The teaching of science at the undergraduate level in the state is only four decades old. The year 1978 is a very landmark in the development of higher education in science in the state as it is the year when science education at the undergraduate level was introduced in Pachhunga University College, Aizawl. This college continued to be the only college teaching science stream in the state at this level for another thirteen years (Wangu, 1995). The Education

Department of state government focused more on the development of undergraduate Arts courses during the first two decades and as a result of which it took two decades, from 1958 to 1978 to introduce Science at the undergraduate level in the state. The second and the third colleges which introduced teaching of science at this level in the state were Lunglei College and Kolasib College in 1991 and 1992 respectively. Government Zirtiri Residential Science College (GZRSC), Aizawl, is the only institution that offers purely science education in the state of Mizoram. Apart from this, there are 5 (five) other colleges where science is imparted along with Arts or Arts and Commerce streams. Thus, at present, out of 28 colleges/institutes, 6 of them offer science education at the undergraduate level including PUC, the only constituent college of Mizoram University (Table - I).

Table I: 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
Lunglei Government College(LGC), 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, Mizoram

The above table reveals 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 two and a half decades (1978-79 to 2004-2005). Thereafter, there has been not only complete halt in opening new science college but also in introducing science courses in the existing institutions of the state. It is a very worrying situation that not even a single college in the state has opened science course during the last seventeen years, that is, from 2004-2005 till date. Hence, it may be mentioned here that the pace of progress of science education in the state seems to lose its momentum and it is indeed not a good sign for the future of higher education in science in Mizoram. The number of colleges offering general science education in the state is only 21.43% of the total number of institutes. This is very low in comparison to the number of colleges offering science education of its sister

states, say, Manipur which stands at 71.64% (Manipur University Annual Report 2020-21). A close observation of the data further shows that out of the six colleges offering science education, two are located in Aizawl, the state capital and one each Champhai, Kolasib, Lunglei and Serchhip districts, whereas remaining six districts including Siaha, one of the oldest districts in Mizoram have no facilities available for higher education in science. This clearly reflects not only the unequal distributions but also imbalance in development of higher education in science in the state.

Development of Enrolment in Science at the Undergraduate Level

Science education at the undergraduate level started in 1978-79 with an intake of only 25 students which increased to 136 in 1990-91. With the introduction of science stream in Lunglei College in 1991-92, the number of students rose to 196. In the following year, with the opening of science stream yet in another college namely, Kolasib college, the number was further increased to 277. The data presented in table- II -A and -B below display the details of enrolment of the undergraduate students of **Pass** and **Honours** courses in science from 2004 - 05 to 2010 - 11 and Semester Courses from 2011 - 12 to 2020 - 2021 in the six colleges of the state offering general education in science. Here, the year 2004-05 is taken as the baseline for enrolment because it is significant as it is the latest academic year that the science was opened in the sixth college of the state.

Table II - A: Enrolment of Undergraduate Students in Science (Pass and Honours) Courses during 2004-05 to 2010-11

Year	2004-2005		2005-2006		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011	
Name of College	Pass	Hons												
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, Mizoram, (ii) Mizoram University Annual Reports: 2005-06 to 2010-11, (iii) Individual Colleges

Table II - B: Enrolment of Undergraduate Students in Science in Semester Course from 2011- 2012 to 2020 - 2021

Name of College	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
PUC	504	622	667	341	401	403	386	877	910	1007
GLC	97	130	138	169	206	188	166	166	207	235
GKC	19	39	35	53	62	61	45	50	33	64
GCC	31	34	57	80	91	83	71	48	52	58
GZRSC	331	368	355	405	422	436	460	563	505	585
GSC	25	43	58	73	85	90	68	66	71	80
Total	1007	1236	1310	1121	1267	1261	1196	1770	1778	2029

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

Data shown in Table II-A reveals that in all these years, that is from 2004-05 to 2010-11, the number of students enrolled in honours course was much higher than that of pass course in science. This is a positive sign as it indicates that students have interest for higher studies in science. Further, a phenomenal growth in the enrolment of students in science was observed from 211 in 2004-05 to 522, 736 and 936 in 2005- 06, 2006-07 and 2007-08 respectively. However, the enrolment data of 2008-09 shows only a little increase in the number of students. Surprisingly, in the following year, there was a drastic fall in the enrolment of students to 694, but the colleges once again regained momentum and administered an increased enrolment of 862 in 2010-11. 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 dramatic fall in the enrolment but increased in 2015-16. There was again a slight decline in enrolment of students in 2016-17 and it was even more in the following year. Surprisingly, a sharp rise in enrolment in science was witnessed in 2018-19 and 2020-21 respectively, although the rise was only a little in 2019-20 (Table II-B). According to Mizoram University Annual Report (2011-12), out of a total of 12,022 students enrolled, 10255, 1007 and 760 were in arts, science and commerce respectively. A close analysis of the data further reveals that science constitutes only 8.38% of the total enrolment which is indeed very low in comparison to the enrolment of 85.30% of students in arts. As per the enrolment data of Directorate of Higher and Technical Education, Mizoram (2017-

18), of the 15,453 students enrolled, 1196 students were in science which accounts for 7.74% of total enrolment only, 0.64% decline from the enrolment of 2011-12. However, according to enrolment data available from the Directorate of Higher and Technical Education, Mizoram, in the year 2018-19 a total of 15,526 students were enrolled of which 13011 in arts, 749 in commerce and 1770 in science. A close observation of the data unfolds that science forms only 11.40% of the total enrolment, a 3.66% rise from the preceding year which is obviously a very healthy sign. But in the following two years, 2019-20 and 2020-21, the enrolment in science remained almost unchanged with 11.97% and 11.89% respectively. From the above discussion, it may be concluded that the overall enrolment status of science is not impressive as it is still very low not only in comparison to arts stream but also in comparison to its sister states, namely, Manipur where science constitutes 36.28% of total enrolment at the undergraduate level (Manipur University Annual Report, 2020-21).

Development in the number of Science Teachers

Science teaching at the undergraduate level was introduced in PUC in 1978-79 with 7 teachers only. With the rise in the number of colleges offering general science education and establishment of a science college in the state, the number of science teachers increased to 109 in 2008-09. Table III below shows the status of science teachers in different departments of the colleges in Mizoram.

Table III: Status of Science Teachers in Colleges as on 30.11.2021

Name of College	Physics			Chemistry			Botany			Zoology			Maths				Biotechnology			Biochemistry			Geology			Environmental Sc			Statistics			Electronics			
	R	C	P	R	C	P	R	C	P	R	C	P	R	C	P	CL	R	C	P	R	C	CL	R	C	P	R	C	P	R	C	G	R	C	CL	
PUC	7	-	-	7	-	-	5	-	-	5	-	-	5	-	-		5	-	-	-	-	-	6	-	-	4	-	-	4	-	1	-	-	-	
LGC	4	-	1	4	-	1	3	1	-	5	-	-	2	2	-		-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	
GKC	2	1	1	4	-	-	1	1	1	4	-	-	2	1	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GCC	3	-	1	1	-	1	3	2	-	4	-	1	2	1	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GZRS C	5	-	-	5	-	-	7	-	-	6	-	-	4	-	-	1	-	-	-	4	1	1	1	3	-	-	-	-	-	-	-	-	-	3	2
GSC	2	1	1	2	1	-	2	2	-	3	-	-	2	1	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	23	2	4	23	1	2	21	6	1	27	-	1	17	5	3	1	5	-	-	4	1	1	10	4	-	4	-	4	4	-	1	-	3	2	

Note: R= Regular, C= Contract, P= Part-time, G = Guest, CL = Casual
 Source: Individual colleges

Table 3 reveals that PUC, the only constituent college of Mizoram University is found to have adequate number of teachers in almost all departments of science. On the other hand, as far as state government colleges are concerned, they are in deplorable state. It is to be mentioned here that even the state's only science college (GZRSC) which was established with an objective to ensure quality science education in the state does not have regular teachers in some of the departments. The college has as many as 6 contractual and 4 casual teachers. Surprisingly, the department of Geology is manned by 1 regular and 3 contractual teachers. Similarly, Lunglei Govt. 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 in some of the departments. The situation is even more lamentable in the rest of the colleges of state government. As per the data available from the colleges, as on November 30, 2021, the total number of science teachers stands at 172 of which 134 are regular, 22 contractual, 11 part-time, 1 guest and 4 casual. Interestingly, except the guest, all other non-regular teachers belong to colleges managed by state government. This clearly shows that there is lack of science teachers in the state government colleges.

Laboratory Facilities

With regard to laboratory facilities, majority of the science teachers of state government colleges expressed that the facilities available are of average level, while the teachers of the only constituent college of Mizoram University divulged that the facilities are very good. They expressed that the laboratories are adequately provided with not only the necessary equipment for practical classes but also sophisticated instruments for promoting and conducting research and development activities in new and emerging areas. The teachers further revealed that the Laboratories were maintained through NER (North East Region) FIST (Fund for Improvement of Science & Technology) of the Department of Science and Technology. Furthermore, the departments of Botany, Chemistry and Zoology have been supported by the Star College Scheme of Department of Biotechnology since 2012.

Library Facilities

As far as the library facilities are concerned, majority of the science teachers under state government colleges revealed that they have adequate number of prescribed books and references books in the library, while the teachers of constituent college expressed that the library facilities are very good. Science teachers of constituent college further expressed that apart from magazines and newspapers, the library also subscribes a number of academic journals for faculty and students.

Science Education at the Post-graduate Level

The history of Postgraduate education in Science in Mizoram is only about three decades old. It took more than a decade to introduce postgraduate education in science in the state after the introduction of science at the undergraduate level in 1978-79. Science education at this level was initiated with the opening of the Department of Forestry in 1990 under North Eastern Hill University (NEHU), Mizoram Campus. However, the department started its M. Sc. Programme two years later, that is, in 1992 with an intake of only 6 students which has now been increased to 30. It began its Ph. D. programme in the year 1997. Before the establishment of Mizoram University, only a few affluent parents sent their children to other states to pursue postgraduate studies in science. The establishment of Mizoram University in 2001 and also with the opening of science subjects one after another, the aspirations of many native students who wanted to study postgraduate science are fulfilled. The Departments of Geology and Environmental Sciences (formerly Department of Forest Ecology, Biodiversity and Environmental Science) were started in May and July, 2002 respectively after the establishment of Mizoram University with an intake of 10 students each. The doctoral programme in the department of Geology was started in the year 2003. The intake capacity of the department has been raised to 20, 25, 30 and 36 in 2009, 2010, 2014 and 2019 respectively. The Department of Environmental Science began its Ph. D. programme in 2005. The intake capacity of the department has also been increased to 15, 20, 25 and 30 in 2007, 2010, 2011 and 2019 respectively. The Department of Physics was started in August, 2003 under the School of Physical Sciences with an intake capacity of 10 students which was then gradually raised to 15, 20, 25 and 30 in 2007, 2010, 2012 and 2013 respectively. It started its Ph. D. programme in 2007. The Departments of Botany and Zoology were initiated under the School of Life Sciences in February and March

2005 respectively with an intake capacity of 10 students each, while the actual classes of both the faculties began only in August, 2006. Both the departments started offering doctoral programme in the following year. The intake of the departments was also increased to 20, 30 and 35 each in 2008, 2014 and 2018 respectively. The Department of Chemistry was opened in August 2006 with an intake capacity of 10 students. In the following year, the department not only increased the intake to 20 students but also introduced the doctoral programme. The intake was further raised to 25, 30 and 36 in 2012, 2016 and 2018 respectively. The Department of Mathematics and Computer Science came into being in the year 2006. The classes, however, started from July 2007 with an intake capacity of 20 students and in the following year the department introduced doctoral programme. The intake of the department was then gradually increased to 25, 30 and 36 in 2011, 2014 and 2018 respectively. The Department of Horticulture, Aromatic and Medicinal Plants (HAMP) was started in July, 2007 with an intake capacity of only 10 students which was then raised to 20, 25 and 30 in 2008, 2012 and 2017 respectively. The department started its Ph. D. programme in the following year. The Department of Biotechnology was introduced as third department under the School of Life Sciences in August, 2007 with 15 students. It began its doctoral programme from the academic session 2008- 09. The table below displays the enrolment of students in different post-graduate departments of science in Mizoram University during 2007-08 to 2020-21.

Table IV: Enrolment of students in different Post-graduate Departments of Science

Name of Dept	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Biotechnology	16	24	24	30	30	26	31	41	49	47	48	57	55	54
Botany	13	13	21	27	26	23	30	46	58	57	57	58	60	64
Chemistry	18	23	27	20	18	20	30	51	56	68	59	63	63	62
Environmental Sciences	8	15	23	31	19	16	23	28	40	47	47	47	48	61
Forestry	14	16	23	30	28	23	26	40	54	58	58	58	58	62
Geology	4	7	20	26	31	37	33	50	61	57	59	57	55	55
Horticulture, Aromatic & Medicinal Plants	9	14	18	9	7	15	22	26	37	47	47	53	57	53
Mathematics & Computer Science	7	14	16	30	29	25	35	55	59	62	69	73	79	75

Physics	11	16	28	27	41	40	41	53	55	60	59	59	60	59
Zoology	12	17	21	25	23	28	32	45	58	57	55	58	56	56
Total	112	159	221	252	252	253	303	435	527	560	558	583	591	601

Sources: (i) Mizoram University Annual Reports: 2006-07 to 2018-19

(ii) Individual Departments

As already stated, the postgraduate education in Science in Mizoram started with an intake of only 6 students of Forestry Department in 1992. However, the opening of various science subjects under different Schools of Sciences coupled with the increase in the intake capacity of various departments of science, the number of students showed a tremendous growth from just 112 in 2007-08 to 601 in 2020-21. This clearly reflects that the state is remarkably progressing in science at the postgraduate level. A close observation of the data reveals 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 once considered as difficult subjects by majority of the native 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 a subject of science under NEHU campus, Aizawl. The rest of the science departments were gradually 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 the course of time, with the opening of new departments of science in the University more teachers were recruited over the years. As a result, the number of teachers rose considerably. In the academic session 2007-08, when all the existing departments of science became functional, the university had altogether 49 teachers in science. Details of the faculty positions of various departments of science in Mizoram University in 2007-08, 2017-18, 2018-19, 2019-20, 2020-21 and 2021-22 are displayed in Table – V

Table V: Faculty Positions in Different Post-Graduate Departments of Science

Name of Department	2007-08		2017-18		2018-19		2019-20		2020-21		2021-22	
	R	G	R	G	R	G	R	G	R	G	R	G
Biotechnology	5	0	6	2	6	3	6	2	6	1	8	0
Botany	5	0	7	1	6	2	6	2	6	2	7	1
Chemistry	5	0	6	0	6	0	5	0	5	0	8	1
Environmental Science	6	0	8	0	8	1	8	1	8	0	8	0
Forestry	5	0	9	0	9	0	9	0	9	0	9	0

Geology	5	0	7	2	7	2	7	0	7	0	7	0
Horticulture, Aromatic & Medical Plants	4	0	6	2	5	3	6	1	7	0	7	1
Mathematics & Computer Science	4	0	6	0	6	0	7	1	6	1	7	1
Physics	5	0	7	1	6	2	6	2	7	1	7	1
Zoology	5	0	7	0	7	0	7	0	6	0	6	0
Total	49	0	69	8	66	13	67	9	67	5	73	5

Note: R = Regular, G = Guest

Sources: (i) Mizoram University Annual Reports: 2007- 08, 2017-18, 2018-19

(ii) Individual Departments

Table V shows that there has been considerable growth in the number of science teachers from 49 in 2007-08 to 73 in 2021-22, an increase of 24 regular teachers. A close observation of the data on latest faculty positions further reveals that all the departments have adequate manpower.

Conclusion

As mentioned, out of 28 colleges imparting general education, science stream is available only in six colleges including a constituent college of Mizoram University. And science education at the undergraduate level is accessible only to five districts out of eleven districts of the state. As per data available for the year 2007-08 from the Directorate of Higher and Technical Education, Mizoram, science formed only 11.46% of the total enrolment at the undergraduate level. As stated earlier, according to data available from the colleges for the year 2019-20, science constitutes only 11.97% of the total enrolment, the highest ever, the second highest being 11.89% in the following year. This indicates that although the number of enrolment has increased considerably over the years the corresponding percentage has not increased much. Moreover, the percentage is very low in comparison to all India enrolment of 16% in science. Apart from this, engagement of teachers on contractual, part-time and even casual basis in the colleges under state government reveals that science education at the undergraduate level in the state still faces problem of shortage of regular teachers. As far as the laboratories are concerned, majority of the teachers of state government colleges expressed that the laboratory facilities are of average level.

Taking into account of the above facts, to conclude, it may be mentioned that the overall development and status of higher education in science particularly at the undergraduate level is not very impressive and the state

still has to go a long way. It is felt that the concerned authority in consultation with experts in the field takes up appropriate measures for the development of higher education in science in the state.

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