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Recent Trends of Students in IT Related Programs of Science and Engineering in Nepalese Universities

Moti Prasad Giri[1], Dinesh Panthi[2], Dinesh Raj Pant[3], Kanhaiya Jha[4]
[1]Mid–West University, Surkhet, Nepal
[2,3]Valmeeki Campus, Nepal Sanskrit University, Kathmandu, Nepal
[4]Kathmandu University, Dhulikhel, Nepal
motipdgiri@gmail.com

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Abstract

In the current digital world, Nepalese universities have given high priority on IT related programs in the domain of science and engineering. Also, changing the modern education system and curriculum in the Universities with global compatibility, Nepal cannot isolate itself from the current trends and technologies. The main objective of this paper is to discuss recent trends of students in some major IT related programs of science and engineering of graduate and undergraduate level in Nepalese universities, as well as the status of the students' performance in examisnations in these programs.

Keywords: Science, Engineering, Trends, Outcomes

Introduction

The evolution of Science and Engineering programs in Nepalese universities over the past few decades reflects broader trends in education and technological advancements globally. Therefore, our universities have given high priority on IT related programs in its curriculum to generate qualified and skilled human resources based on the existing global job markets. We start with the brief introduction to universities having IT related programs.

Tribhuvan University (TU) established in 1959 is the largest and the oldest university of Nepal which has provided higher education in different disciplines and produce high level manpower for the development of country. The programs of TU related to Science and Engineering are general BSc, BSc CSIT, BMath Sc, BIT, BE Computer Engineering, MSc (Mathematics), MSc CSIT and MSc CSKE.

Kathmandu University (KU) established in 1991 is an autonomous, not for profit and self-funding public institution. It is an institution of higher learning dedicated to maintaining the standard excellence in various classical and professional disciplines. The programs of KU related to Science and Engineering are BSc in Computational Mathematics since 2017, BSc in Computer Science, BE Computer Engineering, ME Computer Engineering.

Purbanchal University (PU) established in 1995 is public university which has provided higher education in Nepal. The programs of PU related to Science and Engineering are BCA, MCA, BIT, BE Computer Engineering. Also, Pokhara University (PokU) established in 1997 is a public university which has total of 66 colleges. The programs of PokU related to Science and Engineering are BCA, MSc in Computer Science, BE IT, BE Computer Engineering, and ME Computer Engineering. Again, Mid - West University (MWU) established in 2010 is an autonomous and public institution giving the purpose of higher education in Nepal. The programs of MWU related to Science and Engineering are general BSc, BSc CSIT, and BE Computer Engineering. Finally, Far Western University (FWU) established in 2010 is an autonomous and public institution. The programs of FWU related to Science and Engineering are general BSc, BSc CSIT, and BE Computer Engineering [1].

Most of the universities have focused information technology (IT) related programs with global compatibility. One of the key reasons for this is the rapid advancement in digital technologies, which requires educational institutions to align their curricula with international standards. These programs not only help students gain a comprehensive

understanding of IT, but also prepare them to work in a globalized economy where technological proficiency is essential across all sectors. In the domain of science and engineering, multiple educational activities are going on. But research works are not being run in the necessary level in the universities of Nepal. Information Technology is the recement development in the whole world and Nepalese universities have properly adopted it.

The main objective of this paper is to discuss recent trends of students in some major IT related programs of science and engineering of graduate and undergraduate level in Nepalese universities, as well as the status of the students' performance in examinations in these programs. Our study and results in terms of this review paper has been based on the original primary data received from the concerned universities and so the result is quite realistic as well as significant for future planning.

Recent Trends and Status of Students' Performance

We start with the following university wise (in BS) enrollment and pass out number of students in general BSc programs of TU, MWU and FWU given by Table 1.

Table 1: Enrollment and Pass out of the students in Undergraduate and Graduate Level for Science Program

	Univ.	E	P	E	P	E	P	E	P	E	P	E	P
S. N.	Batch	2070	2074	2071	2075	2072	2076	2073	2077	2074	2078	2075	2079
1	TU	5508	2998	5695	3266	5898	3507	6297	3730	6485	4089	4555	NA
2	MWU	81	57	62	35	101	59	104	54	77	53	58	NA
3	FWU			17	08	55	35	61	44	37	19	21	13

(Source: Office of the Controller of Examinations TU, MWU, and FWU)

Here, E denotes the enrollment and P represents the pass out numbers in corresponding years.

The following diagrams show the enrollment and pass out of the students in BSc program in TU (in Fig 1), MWU (in Fig 2) and FWU (in Fig 3):

Fig.1 Enrollment and pass out of TU in BSc

Fig. 2 Enrollment and pass out of MWU in BSc

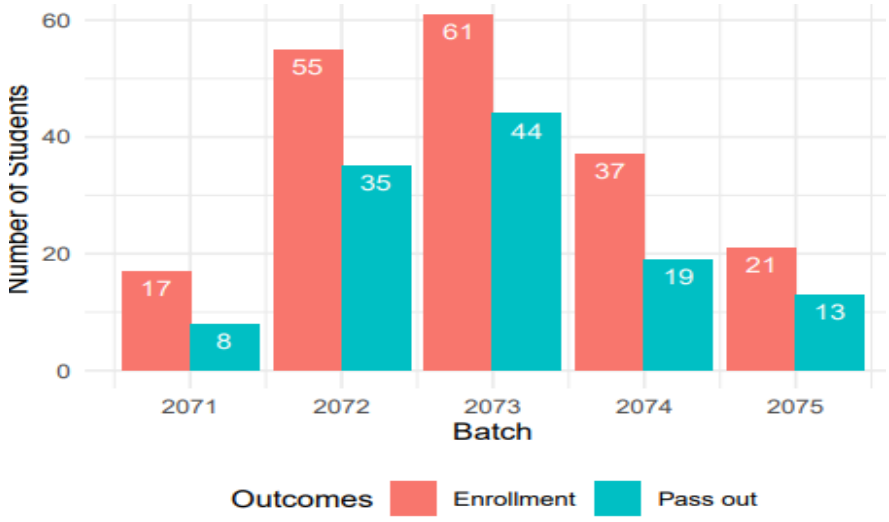


Fig. 3 Enrollment and pass out of FWU in BSc

The BSc CSIT, MSc CSIT and BSc CS are common popular programs in TU, KU, MWU, FWU. The following table shows the university wise (in BS) Enrollment and pass out of the Program of BSc CSIT, MSc CSIT and BSc CS given as follows:

Table 2: Enrollment and pass out of the Program of BSc CSIT, MSc CSIT and BSc CS

S. N.	Univ.	E	P	E	P	E	P	E	P	E	P	E	P
	Batch	2070	2074	2071	2075	2072	2076	2073	2077	2074	2078	2075	2079
4	TU	2280	1014	2142	1189	2390	1219	2545	1253	2781	1375	2434	NA
5	KU	46	34	71	53	68	53	60	09	59	48	61	NA
6	MWU	BSc CSIT Program started from 2073						17	15	12	11	21	NA
7	FWU	20	10	25	15	33	15	47	29	43	25	48	29
8	TU	E	P	E	P	E	P	E	P	E	P	E	P
	Batch	2070	2072	2071	2073	2072	2074	2073	2075	2074	2076	2075	2077
MSc CSIT		25	NA	28	23	26	17	29	18	31	21	30	23

(Source: Controller Office of the Examinations, TU, KU, MWU and FWU)

Also, the following diagrams show the enrollment and pass out of the students in BSc CSIT in TU (in Fig 4) and in BSc CS in KU (in Fig 5):

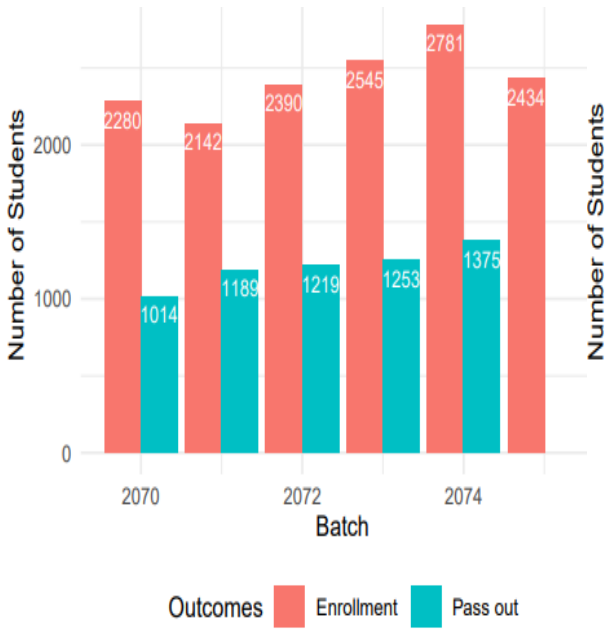


Fig. 4 Enrollment and pass out of TU in BSc CSIT

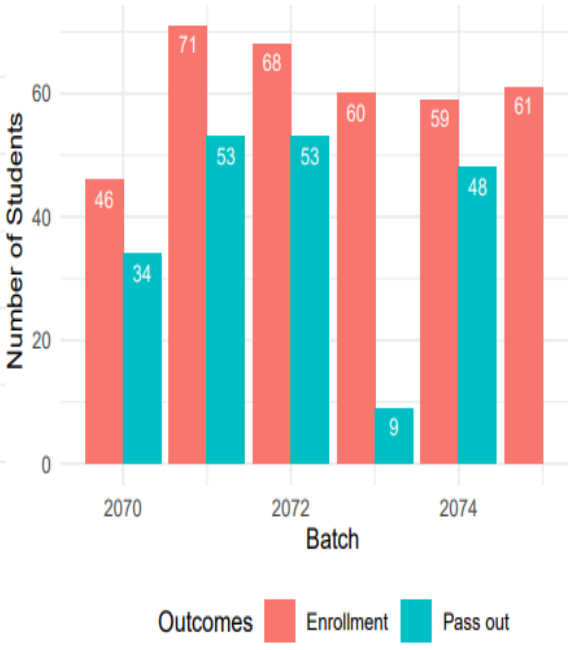
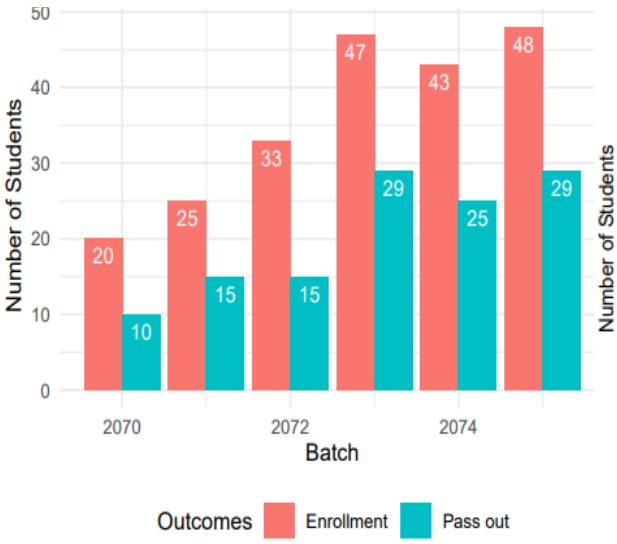


Fig. 5 Enrollment and pass out of KU in BSc CS

The following diagrams show the enrollment and pass out of the students in BSc CSIT in FWU (in Fig 6) and in MWU (in Fig 7):



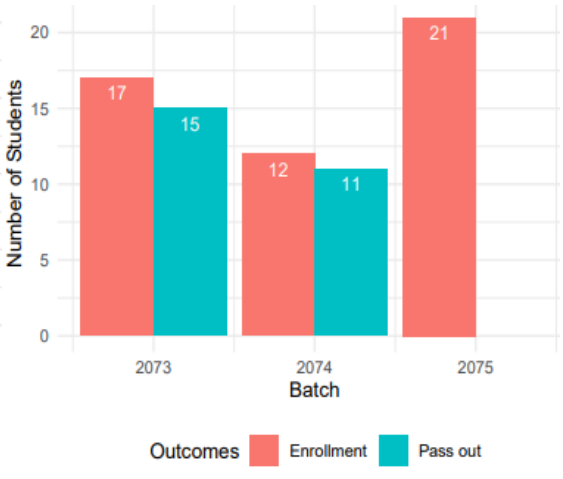


Fig. 6 Enrollment and pass out of FWU in BSc CSIT **Fig. 7** Enrollment and pass out of MWU in BSc CSIT

The following diagram shows the enrollment and pass out of the students in MSc CSIT in TU (in Fig 8):

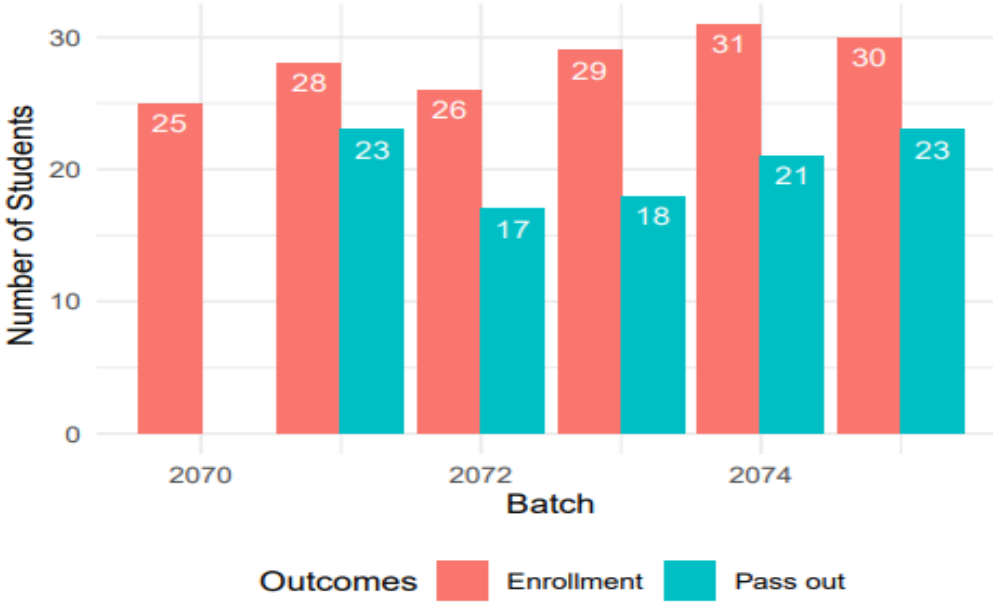


Fig. 8 Enrollment and pass out of TU in MSc CSIT

The undergraduate CE program is popular among the Nepalese youths and so this program is offered by TU, KU, PU and PoKU. The following table shows the university wise (in BS) enrollment and passes out of the students in undergraduate level for computer engineering (CE) program.

Table 3: Enrollment and pass out of the students in Undergraduate Level for Engineering Program

S. N.	Univ.	E	P	E	P	E	P	E	P	E	P	E	P
	Batch	2070	2074	2071	2075	2072	2076	2073	2077	2074	2078	2075	2079
1	TU	629	451	579	427	617	438	576	363	701	428	746	377
2	KU	57	56	58	56	58	54	60	04	60	59	53	NA
3	PU	88	42	124	60	145	63	164	68	183	54	187	42
4	PokU	236	106	332	136	335	159	415	172	482	235	444	NA

(Source: Institute of Engineering, Dean's Office, TU, Controller Office of the Examinations KU, PU, PoKU, and MWU)

The following diagrams show the enrollment and pass out of the students in BE computer engineering (CE) in TU (in Fig 9), in KU (in Fig 10), in PU (in Fig 11), and in PoKU (in Fig 12):

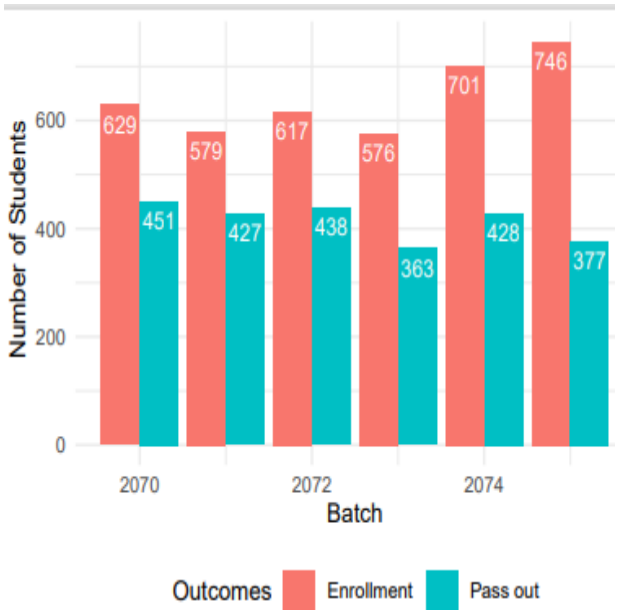


Fig. 9 Enrollment and pass out of TU in BE CE

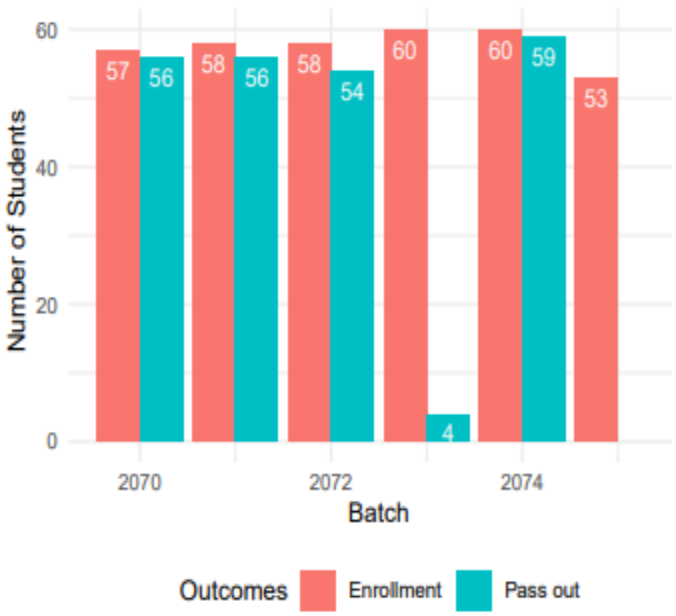


Fig. 10 Enrollment and pass out of KU in BE CE

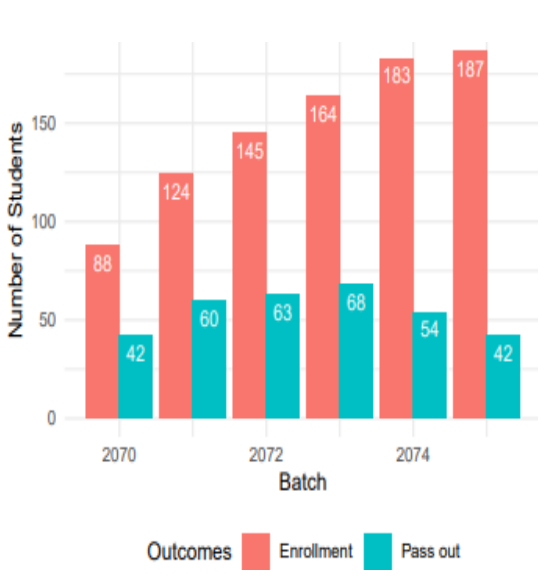


Fig. 11 Enrollment and pass out of PU in BE CE

Fig. 12 Enrollment and pass out of PokU in BE CE

It is always challenging for the university to start the graduate level IT related programs due to availability of qualified human resources as course instructors and the standard laboratories. The following table shows the university wise (in BS) enrollment and passes out of the students in graduate level ME Computer

Table 4: Engineering Program for Graduate Level in ME Computer

S. N.	Univ.	E	P	E	P	E	P	E	P	E	P	E	P
	Batch	2070	2072	2071	2073	2072	2074	2073	2075	2074	2076	2075	2077
1	TU	NA	NA	NA	NA	NA	NA	NA	NA	20	14	20	16
2	KU	12	06	09	04	13	09	No (E)	No (P)	10	07	08	03
3	PokU	24	21	48	26	54	29	54	25	60	57	59	33

(Source: Institute of Engineering, Dean's Office, TU, Controller Office of the Examinations, KU and PokU)

The following diagrams show the enrollment and pass out of the students in ME Computer Engineering (CE) in TU (in Fig 13), in KU (in Fig 14) and in PoKU (in Fig 15):

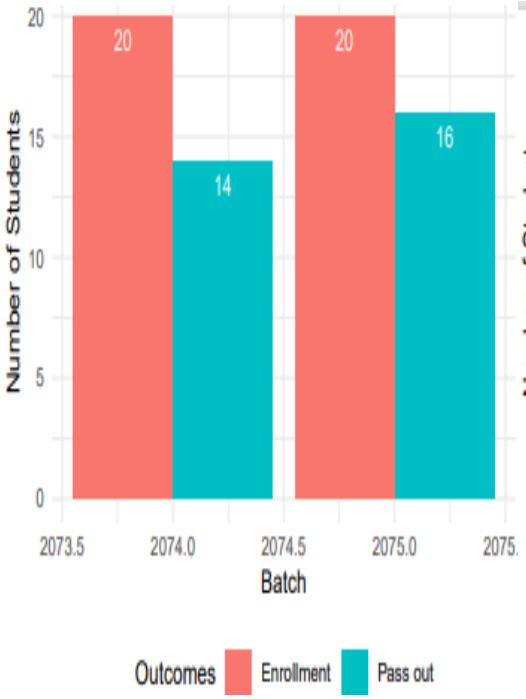


Fig. 13 Enrollment and pass out of TU in ME CE

Fig. 14 Enrollment and pass out of KU in ME CE

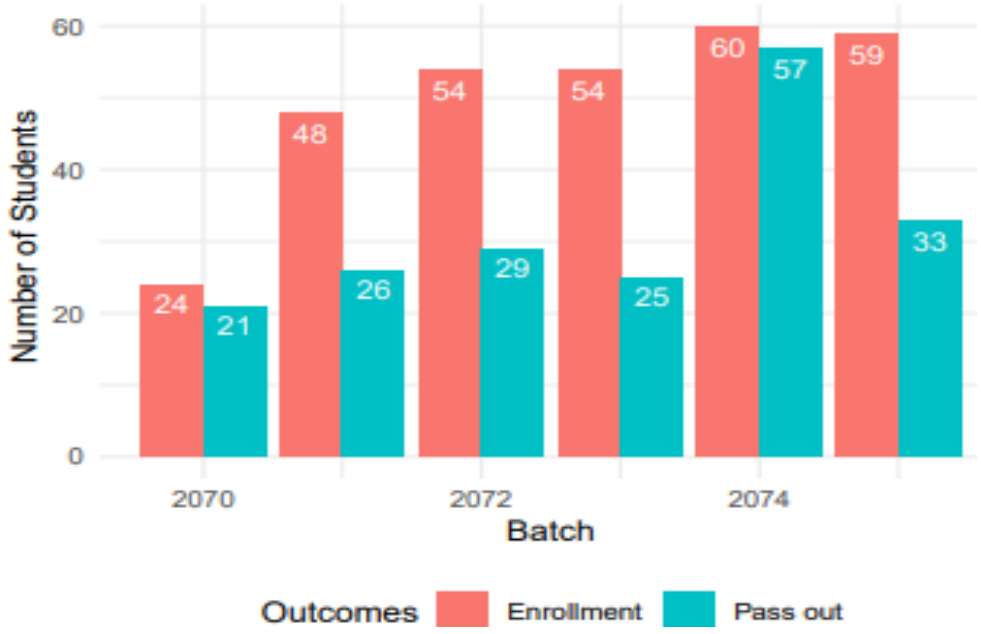


Fig. 15 Enrollment and pass out of PokU in ME computer

The following Table 4 shows the summary of all university wise available datas in undergraduate and graduate levels in science and engineering with enrollment and pass out students in IT related programs. It includes gender: male & female with the drop out number of admitted students.

Table 4: Summary of the Data

Science (Undergraduate and Graduate level)

S. No	Program	Univ.	Batch	Enrollment			Pass out			
				Male	Female	Total	Drop	Male	Female	Total
1	BSc	TU	2069 - 2076	27507	18030	45537	12009	10062	7975	18037
2	BSc	MWU	2069 – 2079	579	177	736	80	244	66	310
3	BSc	FWU	2071– 2079	230	69	299	66	95	24	119
4	BSc CSIT	TU	2066 – 2079	18319	4305	22624	4950	4857	1193	6050
5	BSc CSIT	MWU	2073 – 2079	126	43	169	00	23	03	26
6	BSc CSIT	FWU	2069 – 2079	296	124	420	129	101	25	126
7	BSc CS	KU	2069 – 2079	492	109	601	NA	177	49	226
8	MSc CSIT	TU	2070 - 2079	239	51	290	27	90	12	102

Engineering (Undergraduate and Graduate level)

S. No.	Program	Univ.	Batch	Enrollment			Pass out			
				Male	Female	Total	Drop	Male	Female	Total
1	BE CE	TU	2069 – 2079	6396	1296	7692	NA	2315	517	2832
2	BE CE	MWU	2072 – 2079	153	39	192	NA	37	14	51
3	BE CE	KU	2069 – 2079	503	74	577	NA	239	38	277
4	BE CE	PokU	2069 – 2079	3687	1032	4719	NA	681	228	909
5	BE CE	PU	2069 – 2079	1330	458	1788	NA	275	122	397
6	ME CE	TU	2074 – 2079	85	15	100	NA	40	05	45
7	ME CE	KU	2069 – 2079	46	15	61	NA	40	08	48
8	ME CE	PokU	2069 – 2079	377	72	449	NA	201	37	238
9	BE CE	FWU	2077 – 2079	100	38	138	09	No	No	No

Here, NA represents for Not Available data.

Conclusion

The paper provides a detailed analysis of the trends and issues in some IT related programs in Science and Engineering programs in Nepalese universities. Our study has shown that there is a significant gender gap with very few female students across all programs, indicating a potential area for improvement in terms of gender inclusivity. Also, there is a noticeable shift towards IT-related programs, with increasing enrollment in engineering programs as well. However, there is a concerning decrease in enrollment in BSc programs overall.

The dropout rates vary significantly across different programs. For example, BSc programs like BSc and BSc CSIT from FWU have notably high dropout rates (25% and 39% respectively), whereas PU reports lower dropout rates (approximately 5 - 7%). Again, the pass/fail percentages in exams vary among universities and programs reflecting the poor evaluation scheme. For instance, BE Computer programs at various universities have varying pass rates (e.g. PokU 44% pass, PU 39% pass, KU 69% pass, TU 65% pass).

Our recommendation is that while enrollment numbers may be increasing in some areas, the qualities of education and exam results do not always meet satisfactory levels, indicating a need for improvement in teaching standards and academic outcomes to maintain the quality of knowledge as well as updated skills. There is strong need for universities to focus on improving the quality of education offered, which could potentially help in reducing dropout rates and improving overall academic performance.

Finally, the paper provides a comprehensive overview of the current state of Science and Engineering education in Nepalese universities, also highlights both strengths and areas that require attention and improvement. The trends among students for IT related programs in Science and Engineering programs at Nepalese universities are evolving towards interdisciplinary learning, practical experience, global exposure, and entrepreneurship. Concurrently, efforts are underway to enhance academic standards, career development support, and infrastructure to nurture the growth and success of students in these programs. Our study can help the academic institutions and Government sectors to make a plan and for its effective execution to motivate youths.

References

Giri, M. P., Panthi, D., Pant, D. R., and Jha, K. (2021). On Mathematics and Information Technology Based Programs in Universities of Nepal, *International Journal of Mathematical Sciences and Engineering Applications*: Ascent Publication, Vol.15 (1), pp. 9 – 19. Pune, India.

Panthi, D., R. Basnet and K. Jha (2008). A Study on Teaching Applicable Mathematics in the Universities of Nepal. *Kathmandu University Journal of Science, Engineering and Technology,* Vol. 1 (v), pp. 86 – 94. Kathmandu. Nepal.

Jha, K., (2005). Mathematics Teaching for IT in Universities of Nepal, *Shiksha - Shastra Saurabh*, Vol. 11, pp. 61 – 68. Kathmandu. Nepal.

TU (2023). Office of the Controller of Examinations, Kathmandu: Tribhuvan University

TU (2023). Institute of Science and Technology, Dean's Office, Kathmandu: Tribhuvan University.

TU (2023). Institute of Engineering, Dean's Office, Lalitpur: Tribhuvan University.

MWU (2022). Office of the Examinations Management, Surkhet: Mid – West University.

KU (2023). Office of the Controller of Examinations, Kavre: Kathmandu University.

PoKU (2023). Office of the Controller of Examinations, Kaski: Pokhara University.

PU (2023). Office of the Examinations Management, Morang: Purbanchal University.

FWU (2023). Office of the Controller of Examinations, Kanchanpur: Far Western University.