Trends and Causes of Student Dropouts in a Public Higher Education in Northern Philippines: A Data Visualization Approach

Edison Datul Bravo, DIT

[1]College of Information and Computing Sciences,Cagayan State University, Philippines

Trends and Causes of Student Dropouts in a Public Higher Education in Northern Philippines: A Data Visualization Approach

Edison Datul Bravo, DIT
College of Information and Computing Sciences,Cagayan State University, Philippines
Email:diver.edz@gmail.com

ABSTRACT
This research utilized a quantitative research design and secondary data from the Registrar's Office of a State University in Northern Philippines. The main objective of the study was to analyze the trends and causes of student dropouts over four academic years, from 2019-2020 to 2022-2023 using data visualization techniques.

The findings showed that some programs had higher dropout rates in certain years, which could be attributed to factors such as program difficulty, financial constraints, personal reasons, and others. However, the study also identified programs with consistently low dropout rates, indicating the effectiveness of academic programs and support systems provided by the colleges.

In addition, the findings revealed that CPAD had the highest dropout rate in the initial year, but it had the highest decrease in dropout rate over the four-year period. The College of Human Kinetics had the lowest dropout rate initially but experienced a significant increase over the years. The College of Industrial Technology consistently maintained a low dropout rate.

Furthermore, the study identified financial difficulties as the most common reason for student dropouts, despite the Free Tuition Act, followed by transferring to another institution and health issues.

The study emphasized the importance of understanding these trends and causes to implement appropriate measures for improving student retention. The results can serve as a basis for future actions and recommendations to enhance student success and reduce dropout rates in the university.

Keywords: Academic Year, Causes, Data Visualization, Student Dropouts, Trends, Undergraduate program

INTRODUCTION

Student dropouts have long been a concern to many, especially to administrators and educators alike. Not just for the individual students, but also for the schools and society in general, as the high dropout rate among students might have negative implications. This includes, among other things, a slower rate of economic growth, a decline in the quality of the nation's human capital, and less financial support for education. Moreover, high dropout rates may worsen social inequality by limiting possibilities for people who are unable to finish their education. Xavier and Meneses (2020) pointed out that the likelihood of a student to get a degree, their employability, and their sense of self-worth are all impacted by dropout costs.

The causes of student dropout rates in Philippine higher education are numerous and multifaceted, encompassing both personal and institutional factors. One of the major factors contributing to student dropout is a lack of academic and social integration into the higher education system (Tinto, 1993). Dropout rates are higher for students who feel alienated from their academic programs, instructors, and peers. Financial issues, such as the inability to cover living expenses and tuition fees, have been found to be a significant factor in student dropout (Astin, 1984). Orion et.al (2014) and Sabates et.al (2010) also observed that the reason why students drop out of school was the lack of financial resources or low economic status of a family (Xavier & Meneses, 2020). or the cost of higher education (Parreño, 2019) which may lead to lesser access to education (Nicaise et.al, 2000). However, scholarships and financial aid can lessen the cost of higher education, but many students still find it difficult to make ends meet. Furthermore, students who work and study together could burn out and lose motivation, which might eventually result in dropout.

Likewise, the causes and trends of student dropout in higher education have recently been examined using data visualization approaches. In a study by Park and Kerr (2017), data visualization was utilized to pinpoint the academic and non-academic elements that influence student dropout. The results of the study revealed that socioeconomic position, academic support, and academic preparedness were all very important determinants of student retention. Data visualization was also employed in a study by Brinkman and Kirschner (2018) to

pinpoint the temporal trends of student dropout in higher education. The study reported that the first and second years of an academic program had the highest rates of student dropout, indicating that colleges should concentrate their retention efforts during these times.

Orion, Forosuelo & Cavalida (2014). revealed that academic readiness and motivation are crucial indicators of students' retention in higher education. Consequently, high dropout rates have serious and lasting repercussions. They have negative impacts on the students themselves, who may feel demotivated and might find it challenging to land a job that aligns with their career objectives. Dropout rates also have an adverse effect on the institutions and society as a whole, leading to a decrease in productivity and economic growth.

Therefore, the purpose of this study is to examine the trends and causes behind student dropouts in a public higher education in Northern Philippines. It will look at the various contributing elements to this issue and consider possible remedies. Policymakers, educational institutions, and students will find the research findings useful as they work to increase retention rates and guarantee that more students complete their higher education programs effectively.

METHODOLOGY

The study employed the quantitative research design, utilizing secondary data from the Registrar's Office of a State University in Northern Philippines. The main objective of the study is to analyze the trends and causes of student dropouts covering four academic years, from 2019-2020 to 2022-2023. The research was conducted in four stages: data collection, data cleaning, data analysis and visualization, and finally, data interpretation and report writing. The data was collected at the Registrar's Office and was cleaned to ensure data accuracy and consistency. Then, using the data visualization techniques to uncover trends and causes of student dropouts. Finally, the results were interpreted to provide recommendations for future actions to improve student retention.

RESULTS AND DISCUSSION

The following figures present the drop-out rate of the different undergraduate programs of the eight (8) colleges in a state university for four (4) academic years.
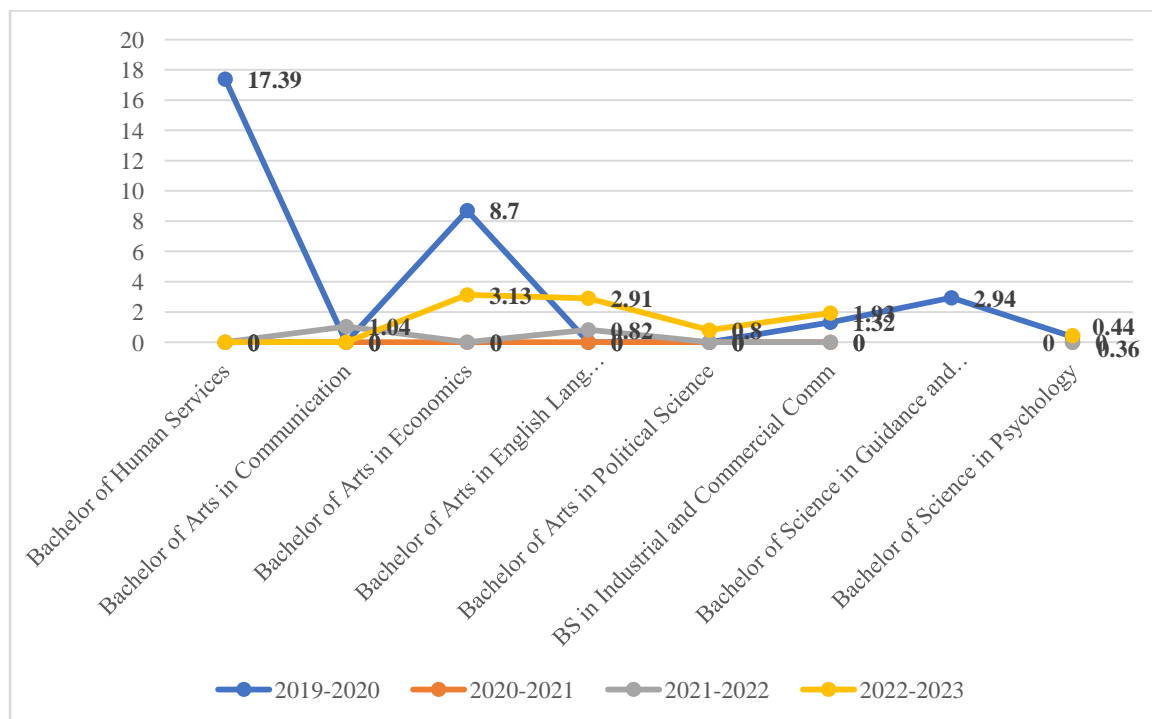

Figure 1:Drop-out Rate of the College of Human and Social Sciences by Program.

Figure 1 shows the percentage of students who left the College of Humanities and Social Sciences for four academic years. As shown in the chart, the Bachelor of Human Services program had the highest drop-out rate of 17.39% in 2019–2020, but there were no dropouts in the years that followed. Similarly, no students left the AB Communication program in the academic years 2019–2020 and 2020–2021, however, 1.04% of students left in 2021–2022 and no students left in 2022–2023.

Similarly, the drop-out rate for the AB Economics program was 8.70% in 2019–2020 and 3.13% in 2022–2023, whereas just 1.3% of students left the BSICC program in 2019–2020 and 1.9% in 2022–2023.

With this data, the college will be able to identify any trends in student turnover and take the appropriate steps to improve retention rates.
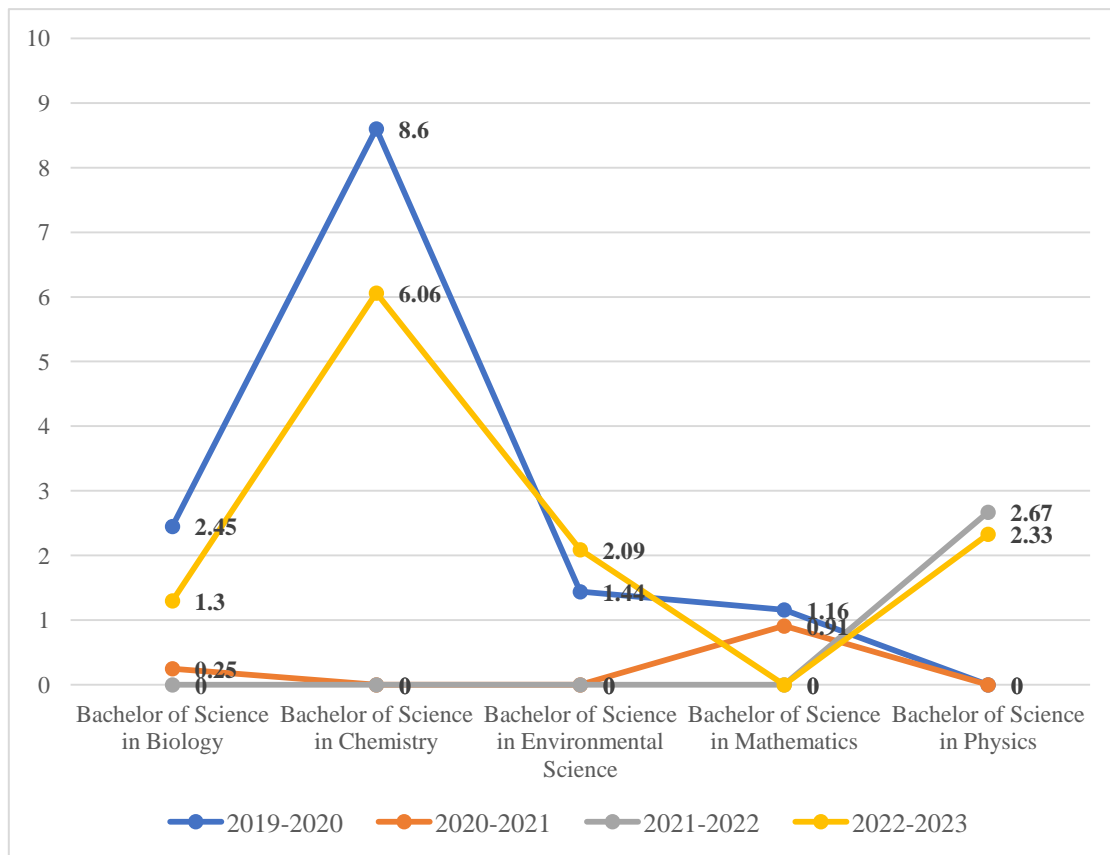

Figure 2:Drop-out Rate of the College of Natural Sciences and Mathematics by Program.

Figure 2 shows the percentage of students who dropped out of their respective programs at the College of Natural Sciences and Mathematics for the years 2019-2020, 2020-2021, 2021-2022, and 2022-2023. The chart indicates that there were 2.45% students of the BS Biology program who dropped out in the year 2019-2020, 0.25% of students dropped out in 2020-2021, no students dropped out in 2021-2022, and 1.30% of students dropped out in 2022-2023. Similarly, the BS Chemistry program recorded a drop-out rate of 8.60% in 2019-2020, no students dropped out in the following years, but 6.06% of students dropped out in 2022-2023. For BS Mathematics program, the drop-out rate was 1.16% in the year 2019-2020. This means that 1.16% of the students enrolled in the program during that academic year decided to leave the program before completing it. In the following year, 2020-2021, the drop-out rate decreased to 0.91%, indicating a lower percentage of students who left the program prematurely. However, in the subsequent two years, 2021-2022 and 2022-2023, the drop-out rate was 0.00%, indicating that no students dropped out during those years.

As for BS Physics, no students dropped out in the years 2019-2020 and 2020-2021, as the drop-out rates were 0.00% for both years. But it increased to 2.67%, in the year 2021-2022, and slightly decreased in 2022-2023 with a drop-out rate of 2.33%, indicating that a relatively higher percentage of students left the program prematurely.
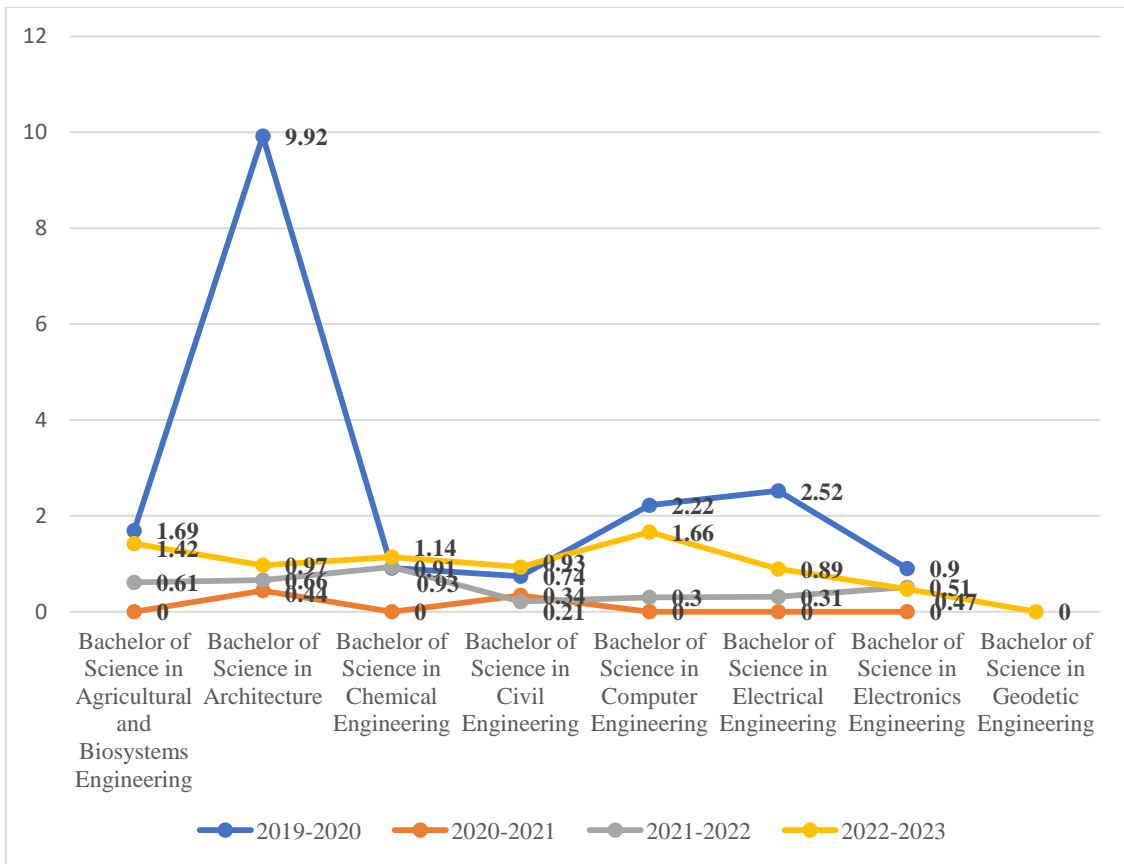
Figure 3:Drop-out Rate of the College of Engineering and Architecture by Program.

The chart depicts the dropout rate for the College of Engineering and Architecture for four academic years. It is evident from the chart that the dropout rates vary significantly across different programs and years. The Bachelor of Science in Architecture program had the highest dropout rate in the first year, which was 9.92%, while the Bachelor of Science in Agricultural and Biosystems Engineering had the highest dropout rate of 1.42% in 2022-2023. Other programs had varying dropout rates in different years.

High dropout rates in some programs can be attributed to several factors, including the difficulty of program, financial constraints, personal reasons, and others. This is supported by Luciano et.al (2022) that lack of funds and financial support can also be one of the major reasons for dropping out. The low dropout rates, on the other hand, may reflect the effectiveness of the academic programs, faculty support, and other support systems provided by the college.
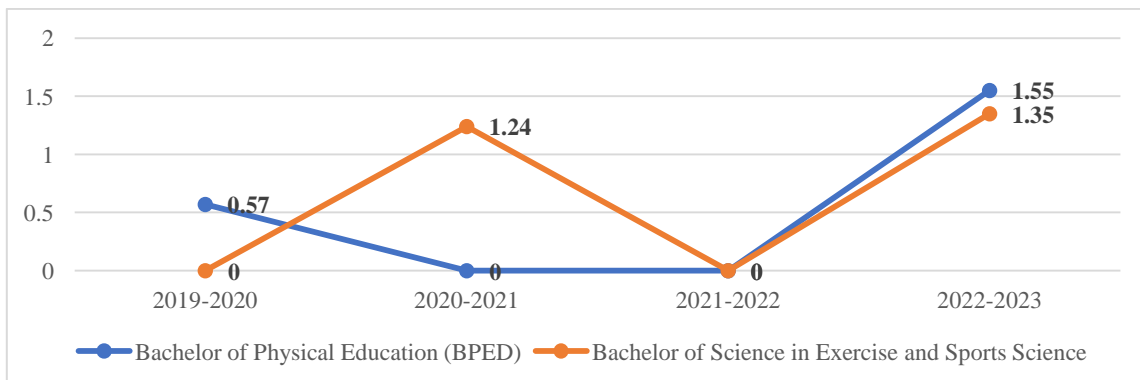

Figure 4:Drop-out Rate of the College of Human Kinetics by Program.

The chart shows that the BPED program had a drop-out rate of 0.57% in 2019–2020, which decreased to 0.00% in 2020–2021 to 2021–2022. However, the dropout rate jumped to 1.55% in 2021–2022. The Bachelor of Science in Exercise and Sports Science program had no dropouts in 2019–2020 but had a 1.24% dropout rate in 2020–2021. There were no dropouts the following academic year, although the dropout rate increased significantly to 1.35% in 2022–2023. The chart reveals that during the height of the pandemic, there were no

students who dropped out from the BPED program which can be attributed to the various measures and adaptations that were undertaken by the College to support students and ensure their academic success.
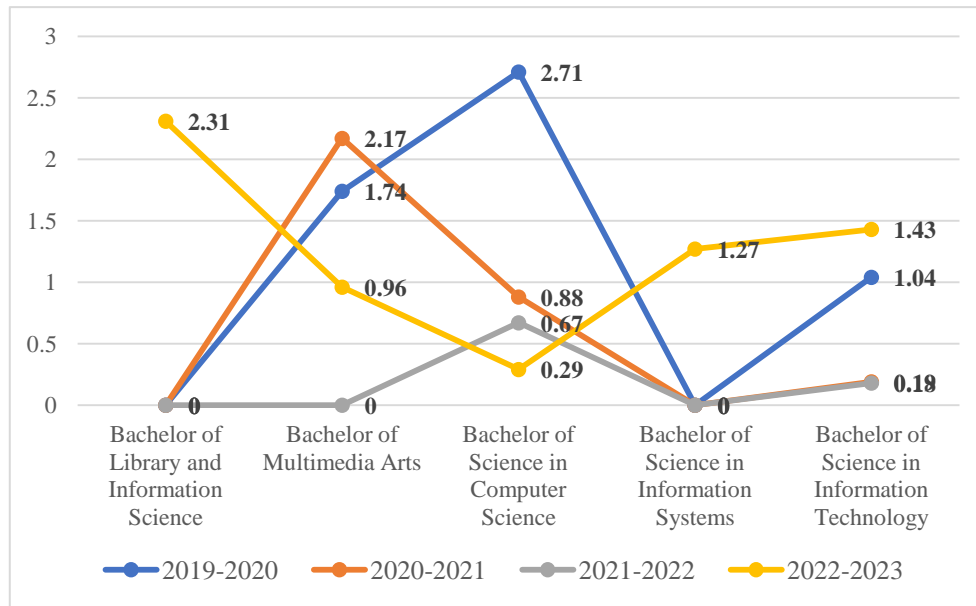

Figure 5:Drop-out Rate of the College of Information and Computing Sciences by Program.

Figure 5 reveals the percentage of students who have dropped out from the College of Information and Computing Sciences. The chart shows that BLIS and the BSIS program had no dropouts for three academic years. The Bachelor of Multimedia Arts program had a drop-out rate of 1.74% in 2019-2020, which increased to 2.17% in 2020-2021 but decreased to 0.96% in 2022-2023. While the BSCS program had a relatively high drop-out rate of 2.71% in 2019-2020, which decreased to 0.88% in 2020-2021, 0.67% in 2021-2022, and 0.29% in 2022-2023. Finally, the BSIT program had a drop-out rate of 1.04% in 2019-2020, 0.19% in 2020-2021, 0.18% in 2021-2022, and 1.43% in 2022-2023.

The table shows that, except for the Bachelor of Multimedia Arts and Bachelor of Science in Information Technology programs, which had a slight increase in drop-out rates in some years, the drop-out rates for most programs in the College of Information and Computing Sciences have generally decreased over time. The drop-out rates for CICS are relatively low, demonstrating that the programs are successful in giving their students support and resources.
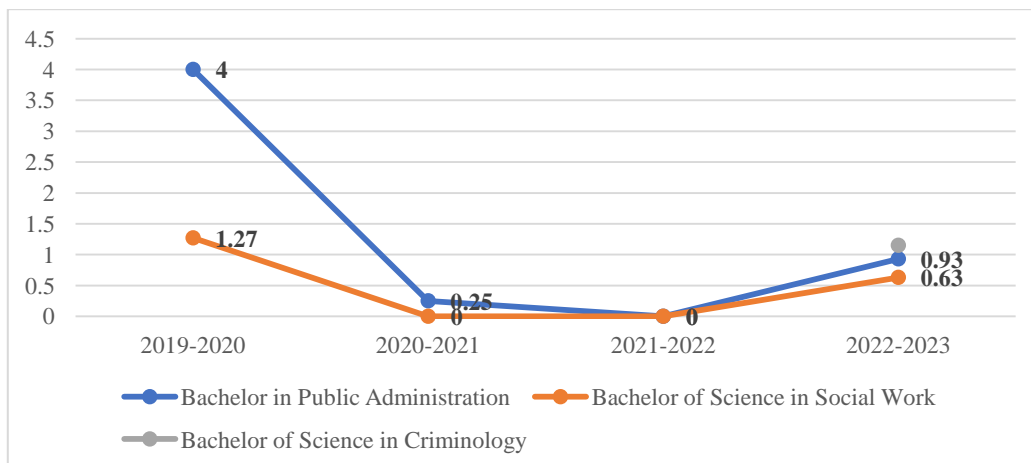

Figure 6:Drop-out Rate of the College of Public Administration by Program.

Figure 6 shows the drop-out rates by program for the academic years 2019–2020 to 2022–2023 of the College of Public Administration. As shown in the chart, the BPA program had a drop-out rate of 4.00% in 2019-2020, which decreased to 0.25% in 2020-2021 and was zero in 2021-2022. In 2022–2023, it did, however, rise slightly to 0.93%. This pattern implies that the program has been effective in keeping its students.

For the BSSW program, the drop-out rate was 1.27% in 2019-2020, which decreased to zero in 2020-2021 and 2021-2022. In 2022–2023, it did, however, rise slightly to 0.63%. The BS in Criminology program was only offered in 2022–2023, hence, it only recorded a drop-out rate of 1.15% during that year.

In general, the College of Public Administration has been successful in retaining its students in its two programs as evidenced by the decreasing trend in the drop-out rates over the years.
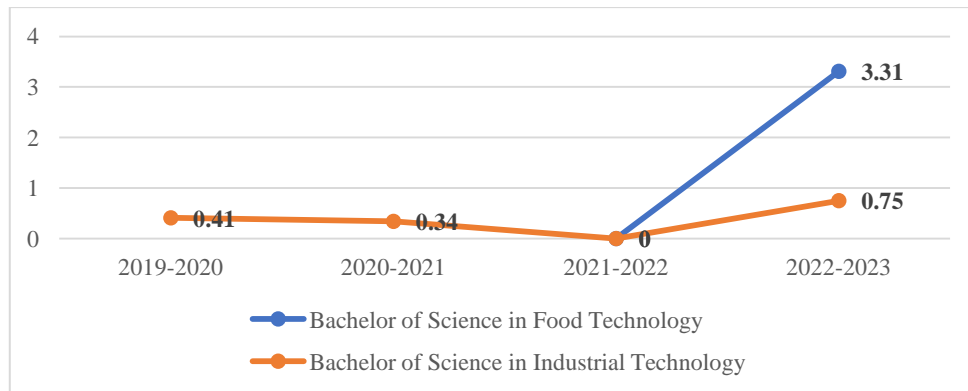

Figure 7:Drop-out Rate of the College of Industrial Technology by Program.

Figure 7 depicts the dropout rates of CIT by program from 2019-2020 to 2022-2023. The chart shows that there were no recorded dropouts for the Bachelor of Science in Food Technology program in 2019-2020, while the dropout rates in 2020-2021 and 2022-2023 were 0% and 3.31%, respectively. This shows that no students left the program in 2019-2020, while all enrolled students stayed in 2021-2022, and 3.31% of students left in 2022-2023.

As shown in the chart, the dropout rate for the BS in Industrial Technology program in 2019-2020 was 0.41%, and it reduced to 0.34% in 2020-2021. In 2021-2022, there were no recorded dropouts, but the dropout rate increased to 0.75% in 2022-2023. This indicates that just a small number of students dropped out over these years, with a zero-dropout rate in 2021-2022. Furthermore, the dropout rates for both programs at the College of Industrial Technology are relatively low, showing that students who enroll in these programs are generally committed to completing their degree requirements.
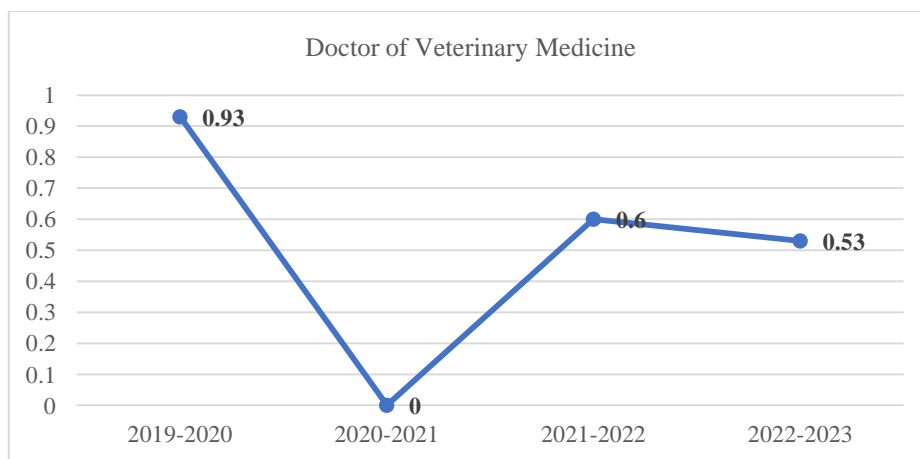

Figure 8. Drop-out Rate of the College of Veterinary Medicine

As shown in the graph, the dropout rate for the Doctor of Veterinary Medicine program in 2019-2020 was 0.93%. This means that 0.93% of the students enrolled in the program during that academic year dropped out before finishing it. The drop-out rate declined to 0.00% in the next year, 2020-2021, indicating that no students dropped out of the program during that year. The dropout rate increased slightly to 0.60% in the following school year. This implies that a small number of students left the Doctor of Veterinary Medicine program before completing their studies. Finally, in the most recent academic year, 2022-2023, the dropout rate went down to 0.53%.
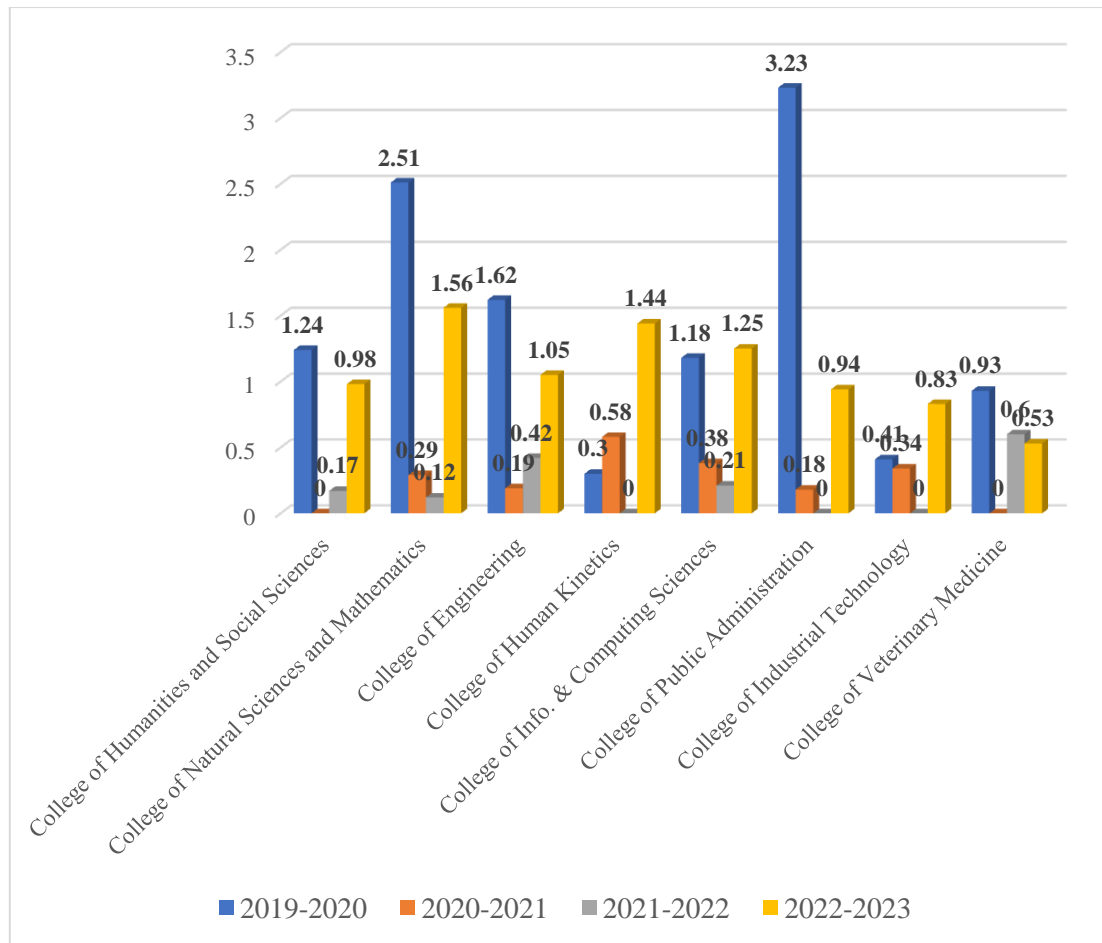
Figure 9:Drop-out Rate by College.

Figure 9 shows the dropout rate by college from 2019-2020 to 2022-2023. The data reveals that the College of Public Administration had the highest dropout rate of 3.23% in 2019-2020 while the College of Human Kinetics had the lowest rate at 0.30%. However, the College of Human Kinetics had the highest increase in dropout rate from 2019-2020 to 2022-2023, with an increase of 1.14%.

The College of Industrial Technology had a consistently low dropout rate, with a zero rate in 2021-2022 and a higher rate of 0.83% in 2022-2023. CHSS had a low dropout rate in 2020-2021 and 2021-2022, but it increased to 0.98% in 2022-2023. The College of Veterinary Medicine had a low dropout rate in 2019-2020 and 2021-2022, but it increased to 0.60% in 2022-2023.

The College of Engineering had drop-out rates of 1.62% in 2019-2020, 0.19% in 2020-2021, 0.42% in 2021-2022, and 1.05% in 2022-2023. These rates were relatively consistent over the years, showing a minor increase in 2021-2022 compared to the preceding and following years. On the other hand, The College of Information and Computing Sciences had drop-out rates of 1.18% in 2019-2020, 0.38% in 2020-2021, 0.21% in 2021-2022, and 1.25% in 2022-2023. The rates varied a little but generally remained moderate, with no significant increase or decrease over the years.
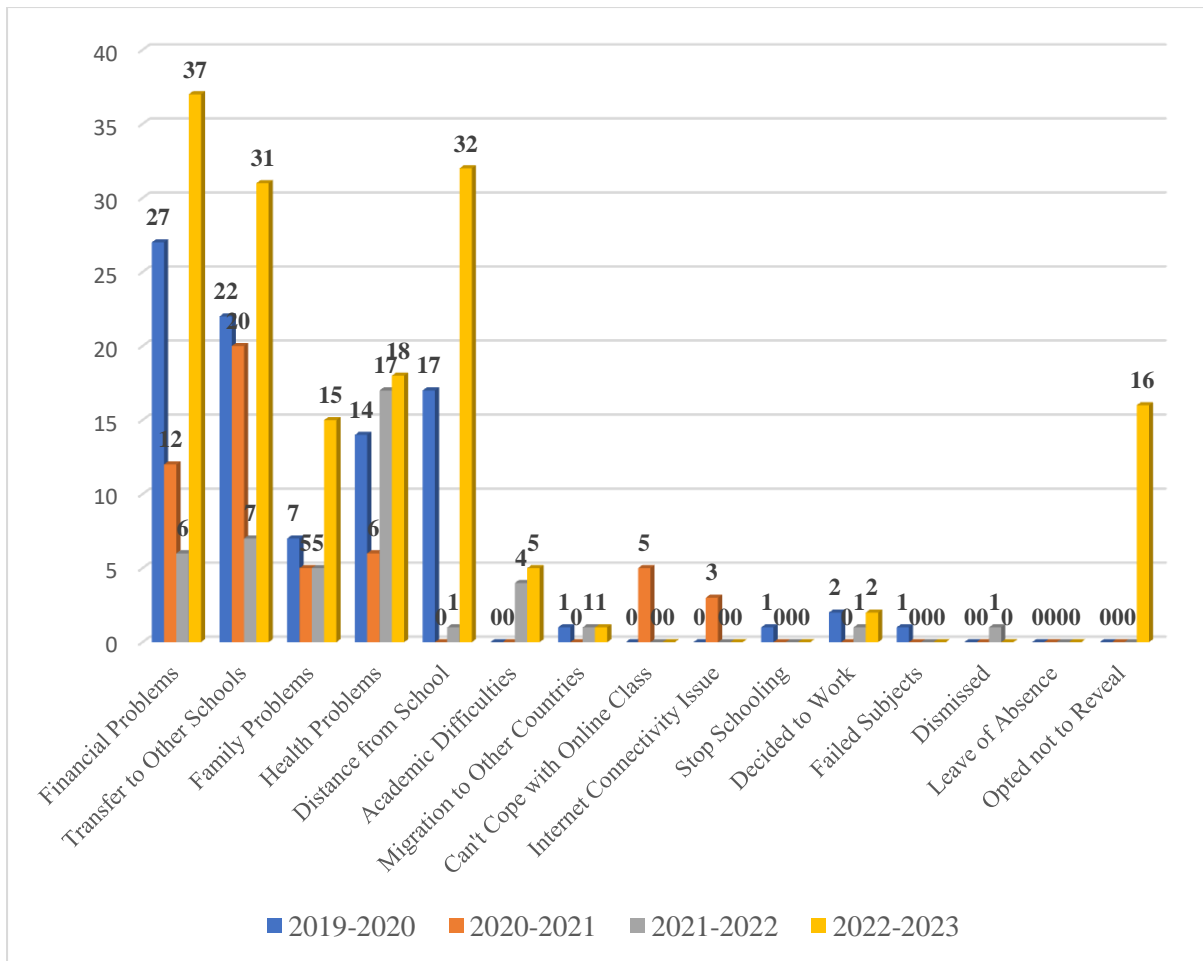
Figure 10:Reasons for Dropping Out

The reasons for dropping out among CSU Carig students for four (4) academic years are displayed in Figure 10. With 27 students leaving in 2019–2020, 12 in 2020–21, 6 in 2021–2022, and 37 in 2022–2023, the data shows that financial difficulties are the most common cause of student drop-out which was one of the reasons of students who also leave their online courses (Park & Kerr, 2017). Although the Free Tuition Act ensures that tuition fees are covered, there may be additional considerations such as allowances and other financial demands that make this a difficulty. With 22 students dropping out in 2019–2020, 20 in 2020–21, 7 in 2021–2022, and 31 in 2022–2023, transferring to another institution is another cause for leaving school. The students may have transferred or preferred a different school or program, or they may have moved to another location.

With 14 students leaving in 2019–2020, 6 in 2020-2021, 17 in 2021-2022, and 18 in 2022-2023, health issues were another frequent cause for leaving. This may be due to the students' physical or mental health problems preventing them from completing their studies. Another reason for dropping is the distance from school with 17 students left in 2019–2020, and 32 in 2022–2023. It is clear that no one left school in 2020–2021, when the pandemic was at its worst, and only one student did so in 2021–2022, where classes are held online.

Other reasons for dropping out include difficulty handling online classes, migration to other countries, academic challenges, and family issues. Interestingly, 16 students chose not to disclose their reasons for leaving school in 2022-2023. This indicates that that there are other underlying problems that the school needs to address to prevent more students from dropping out.

CONCLUSIONS AND RECOMMENDATIONS

Based on the presented data and analysis, it was found that dropout rates varied across different colleges and programs with some programs within the colleges exhibited higher dropout rates than others. Financial constraints emerged as a common reason for students dropping out, followed by transferring to another institution and health issues. The data implies that despite the Free Tuition Act, students may still face additional financial challenges that lead to dropout. Transferring to another institution and health issues were also significant factors contributing to student attrition.

Based on the conclusions, the following recommendations can be made to improve retention rates and address the identified issues:

1. The university should consider expanding financial assistance programs to address the additional financial demands students may face beyond tuition fees. This could include providing scholarships, grants, or emergency funds to support students in need.
2. The university should evaluate the reasons behind students transferring to other institutions and explore ways to enhance the programs and services offered to meet their needs. Providing better academic and career counseling, as well as creating partnerships with other universities for seamless transfer processes, could help retain more students.
3. Recognizing the impact of health issues on student attrition, the university may prioritize the implementation of comprehensive health and wellness programs.
4. Colleges with programs that consistently exhibit high dropout rates should develop targeted interventions to support students. These interventions could include academic support services, mentoring programs, and early identification of students at risk of dropping out.
5. The university should continue monitoring and evaluating the dropout rates of its programs on an ongoing basis. Regular data analysis can help identify trends and patterns, enabling the development of timely interventions to improve retention rates.

REFERENCES

1. Brinkman, W. P., & Kirschner, P. A. (2018). The Temporal Dynamics of Student Dropout in Higher Education: A Systematic Review. Educational Research Review, 25, 37-47.
2. Kreng Heng, Soth Sok, Fata No (2016). School Dropout in Cambodia: A Case Study of Phnom Penh and Kompong Speu. Retrieved from https://www.researchgate.net/publication/369233077_School_Dropout_in_Cambodia_A_Case_Study_of_Phnom_Penh_and_Kompong_Speu
3. Li, G. & T. Killian. Students who left college: An examination of their characteristics and reasons for leaving. AIR Forum Papers, (ERIC ED 433 779), 1999.
4. Luciano, Ruth G.; Olipas, Cris Norman P.; Dela Cruz, Arnold P. (2022). Factors Affecting the Dropout Rate among Information Technology Students: A Basis for an Intervention Plan. International Journal of Advanced Research and Innovative Ideas in Education (IJARIIE) v8 n4 p2013-2017 2022.
5. Nicaise, I., Tonguthai, P., & Fripont, I. (2000). School dropout in Thailand: Causes and remedies. Flanders, Belguim: Katholieke Universiteit Leuven.
6. Orion, H. C., Forosuelo, E. J. D., & Cavalida, J. M. (2014). Factors Affecting Students' Decision to Drop Out of School. SLONGAN, 2(1), 16. Retrieved from https://rpo.cjc.edu.ph/index.php/slongan/article/view/4
7. Park, Y., & Kerr, M. S. (2017). Data Visualization Literacy as a Tool to promote Data-driven Decision-making. eLearning & Software for Education, 1, 235-240.
8. Parreño, Samuel John. (2019). Reasons for School Dropout in the Philippines. Available at SSRN: https://ssrn.com/abstract=4148093 or http://dx.doi.org/10.2139/ssrn.4148093.
9. Ricardo Sabates, Kwame Akyeampong, Jo Westbrook and Frances Hunt (2010). School Drop out: Patterns, Causes, Changes and Policies. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000190771
10. Willging, Pedro A., Johnson, Scott D. (2004). Factors that Influence Students' Decision to Dropout of Online Courses. Journal of Asynchronous Learning Networks, Volume 8, Issue 4. DOI: 10.24059/olj.v8i4.1814
11. Xavier, M., & Meneses, J. (2020). Dropout in Online Higher Education: A Scoping Review from 2014 to 2018. Barcelona: eLearn Center, Universitat Oberta de Catalunya. https://doi.org/10.7238/uoc.dropout.factors.2020