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# Enrolment Trend Analysis among Transition Periods of a University for Management Intervention

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**Abstract:** ***Utilizing the information of the past and the present will result to a better preparation of the future. This research intended to investigate the patterns (trends) in the enrollment status among three transition periods of one State University in the Philippines by analyzing the enrollment trends in the past 45 years. Using descriptive research design, it validated the hypothesis of no difference on the enrollment trends for the past 45 years. Analysis of Variance (ANOVA) was utilized to find any differences while regression trend model was used to find the best fit. The result showed that the trend became fractal on the transition from College of Agriculture Technology to Polytechnic College since an avenue for offering of other programs was open during the transition. Likewise, a consistent increasing trend of enrollment was found among the three transition periods of the university. It was also found out that significant difference existed between the enrolment trend during BNCAT and LSPU, and LSPC to LSPU while the trends from BNCAT to LSPC are the same. Finally, the study found, with high level of confidence, the fit model for the trend and was able to provide forecasts of the enrollees for the next decade.***

**Keywords:** Transition, Model, LSPU

## 1. Introduction

Education is an indispensable tool for the development of a society. According to the human capital theory, the improvement of the economy of a nation is dependent on the quality of education. The statement provides an implication that the more educated a person is, the higher the chances of economic progress. The importance of education in relation to the development of a country is well articulated by Mendoza (1994) who averred that realizing that the educated human resources can activate the development syndrome, which leads to progress, developing countries, and even developed ones expend effort, time and fiscal resources to develop the potentials of their citizenry. They try to approach the problem through the formal and non-formal education and through various government and non-government programs and projects. But sadly, efforts at extending educational opportunities to all groups of school age population have not been very fruitful, and developing countries like ours are still saddled with the progressively expanding concern. For instance, Cabarteja (2002) revealed that every opening of school year in the public schools throughout the country, the Department of Education (DepEd) is always confronted with the perennial problems that are hindrances in the attainment of quality education – the ultimate vision of the department. These perennial problems include the lack of classroom, learning guides and books, incompetency of teachers, unavailability of teaching materials, insufficient information available in libraries, and other learning facilities, school buildings, irrelevant curricula, etc. The same problem is also experienced by State Universities and College when the government decided reducing their budget allocation (Durban and Catalan, 2012) and earlier Asuncion (2002) reported that despite allotting a big chunk of national budget to education as required by the constitution, still there is an inadequate facilities and equipment. In 2012, subsidies in real terms for state universities and colleges have been reduced by 1 percent, following an 8 percent reduction in the preceding year. Capital outlays for public tertiary institutions remained at zero for a second year even as enrollment grows at a faster rate than for private institutions. In 2010, the public enrollment rate was up 10.2 percent compared to 2.7 percent for the private system (Pastrana, 2012).

The reports of Cabarteja (2002), Asuncion (2002) and Durban and Catalan (2012) as cited above are indication of mismatching in the plans and resources. This is bound to happen if planning is only done using centralization approach without the participation of the local levels; or if ever also there is any planning exercise done at the local levels or school levels, or even if there are planning exercises to be done if there is no in-depth analysis of the facts if ever there are data available. Submission of budgets for inclusion in the national budgets is usually done towards the end of the year and there are also times or many times even that we make plans based on "guestimates" just so to beat the deadline given to us. Apparently, there is lack of analytical and predictive planning tools as a basis for a prospective solution to problems that are perennially encountered in the local levels. The absence of planning database and appreciation of analytical exercise prior to plan preparation contributes to producing and implementing plans that are not in consonance with existing situations and problems that we want to address and solve in the local or school levels.

## 2. Literature Review

Formal education is the hierarchically developed and graded learning conceived and provided by the formal school system

and for which diploma/certificate of completion is required for the learner to move to higher levels. In the Philippines, education corresponds to the following level as prescribed by RA10533 or K-12 Law: kindergarten, elementary education which is in the first stages of compulsory, formal education that primarily concerned with providing foundation of education and usually corresponding to kinder up to grade six levels, secondary education which follows elementary education, concerned with continuing basic education and expanding it to include the learning of employable gainful skills, corresponding to four years junior high school and senior high school; and tertiary education schooling leading to a degree in a specific profession (NSO, 1994 & RA10533).

Despite the relatively high average years of schooling and high college enrollment rate in the Philippines, the Global Economic Forum has found the country's labor and technological and quality preparedness very poor compared to East Asian neighbors, including Indonesia and Vietnam. In 2010, the country ranked 85 out of 139 countries for overall global education competitiveness (Tan, 2s011).

In 2007/09, there was a decrease in enrolments, though not big, compared to 2007/08 but noteworthy as there was a decline in enrolment in priority disciplines, including SEM (Science, Engineering and Mathematics). In 12 of the private HEIs examined in the study of Tayag (2012), the number of students enrolled in mathematics and science had gone down to below 100 prescribed for baccalaureate programs. In addition, enrolment has increased in business studies, information technology, and service trades.

The Trend Analysis system is a tool that can be used to examine various database tables for trend over time. It can also be used to discover patterns with the data such as large differences between consecutive years reported and gaps when no data were reported (CPEC, undated). It is based on long time-series data (Mehta, undated) and is basic to understanding past behavior, evaluating current accomplishment, planning future operations, and comparing different time series (Agbisit, 1991). Furthermore, Agbisit (1991) revealed that time series and trend analysis provide a picture of change. They represent a systematic and orderly manner of presenting, describing, analyzing, and interpreting a given set of data. It is defined as a sequence of repeated measurements made periodically through time. The values or measurements correspond, therefore, to successive points of time. The conclusions that can be derived in a trend study analysis are three-fold. First, trend analysis is found as effective method in discovering the temporal association between retention and categorical factors. Second, it (trend analysis) can be used to formule a forecasting model to predict some specific afions. Finally, the scale of variables used in the formation for the forecasting model affects the forecast accuracy (Tsui, Murdock and Mayer, circa 1994).

## 3. Theoretical Framework

This present study anchors on the theory of Sustainable Development proposed by the World Commission on Environment and Development (1972) which attempted to give emphasis and integrate social pulses to culture-based and environment-based problems. An economic model sees to sustain natural and financial capital; an ecological model views the biological diversity and ecological integrity; a political model peruses to social systems that realize human dignity. Religion has entered the debate with iconic, critical, and challenging resources for culture mobility.

The relevance of the theory of sustainable development is strengthen with the theory of Enrollment Management (Hossler, 1984) stating that enrollment management involves more broadly based and all-encompassing activities in addition to marketing of institution and selection of students.. The outcome of the management initiative and sustainable development can be realized through the increase in enrollment of a certain higher institution hence, these theories served as the foundation. Based on the relevant theories presented, the paradigm is constructed to discuss graphically the connections among variables.

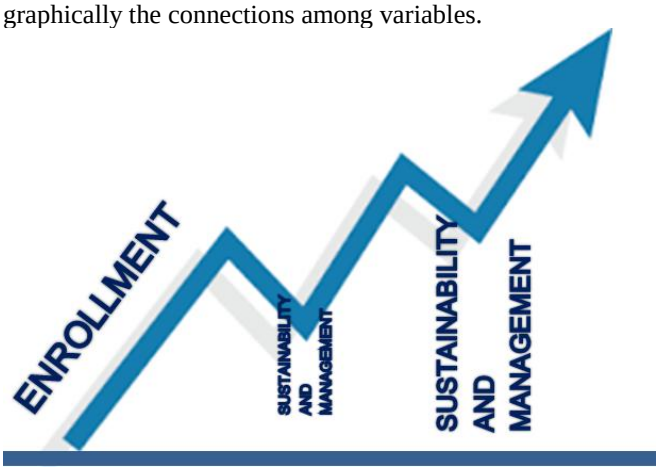


**Figure 1:** Paradigm of the Conceptual Framework

**Research Questions**

In general, the objective of the study is to analyze the trend in the enrolment of college students in Siniloan Campus of LSPU.

In particular it seeks to answer the following questions:

1) What is the average annual growth rate of student enrolment for the past 45 years?
2) In which transition period of the university showed greatest number of enrollees?
3) What Mathematical equation model can be generated to predict the enrollment status in the next enrollment period?
4) Is there a significant difference between and among the enrollment trends in different transition periods of the university?

**Hypothesis**

The difference between and among the enrollment trends in different transition periods of the university is not significant.

**Significance of the Study**

The result of these analysis would provide planning officers the analytical framework for preparing their plans, the local policy-makers of legislative councils of LGUs the basis for

formulating policies to support higher education in their jurisdictions, and decision-makers the basis for accessing funds from the national, provincial and municipal governments, and even from the barangay councils and non-government organizations. The results would provide them the analysis geared towards developing medium and long terms plans, programs, and projects. The present undertaking covers enrolment of college students in the Siniloan Campus of LSPU in its three transition periods from BNCAT, LSPC and LSPU.

## 4. Materials and Methods

This study used the descriptive design of research. Descriptive design of research establishes the answer in the question 'what is' rather than what was and what will be. This design was utilized with the purpose of identifying the trend patterns in the enrollment of Laguna State Polytechnic University. The data required in this study are secondary data to be obtained from the Registrar's Office of the University. These data include aggregate data of students' enrolment for the past 45 years consisting of three transition periods from college and university. Annual averages and percentage growth enrolment and total enrolment through the years were computed. The data for the three transition periods were compared and the growth of each enrolment. Of the three methods of analyzing trend (Agbisit, 1991), the least squares method is the most widely used method of fitting linear trend using the simple linear regression model would be followed in the analysis. The values for *a* and *b* in the linear equation would be estimated and the result would be plotted in a graph.

## 5. Results and Discussion

The average annual growth rate of enrollment for the past 45 years is reflected on the table below. As the data reveal, the highest average rate happened during 1983 to 2006 where the university is still a College while 5.13 percent only is the average rate from 1971-1982. The average rate of enrollment during 2007-2016 is 10.85. The findings show that after the conversion of the university from BNAVS to LSPC, large changes happened when it comes to enrollment (SD=58.34). While gradual change is observed from 1971-1982. The enrollment trend abruptly changed when LSPC became a university (LSPU) in which the average student enrollment increased from tremendously increased from 457 to 3268 with a standard deviation of 6.37. This change implies progression in the enrollment of the students. As to increase in the enrollment percentage, the conversion from BNCAT to LSPC gained 226.58% while from LSPC to LSPU, a percentage of 614.80% in the enrollment is seen. From its conversion from National High School to College to University, the enrollment continues to increase following a certain pattern.

The figures presented show that the greatest number of enrollment is found on the transition period from 2007-2016 where the school was converted to a State University through Republic Act 9402. This is revealed by the average number of enrollment which is 3268. By focusing on the specific figure, it is found that there is an increasing pattern traced by the three transition periods. It is also noteworthy that there is a consistent gradual increasing enrollment pattern from 2007-2016 in contrast to the other transition period where graphs illustrated in a fractal pattern. The low average number of enrollment during the period 1970-1983 can be attributed to the offering of courses since it was noted that there was only one course being offered that time - Agriculture. The transition period from BNCAT to LSPC provided avenue for other courses to be offered such as Education, Hotel and Restaurant Management.

Hence, the average number of enrollment during the period 1983-2006 is found as significantly higher than the previous period. Data reveal also that the conversion from College Institution to a State University encouraged stakeholders to enroll their students to be in the university.

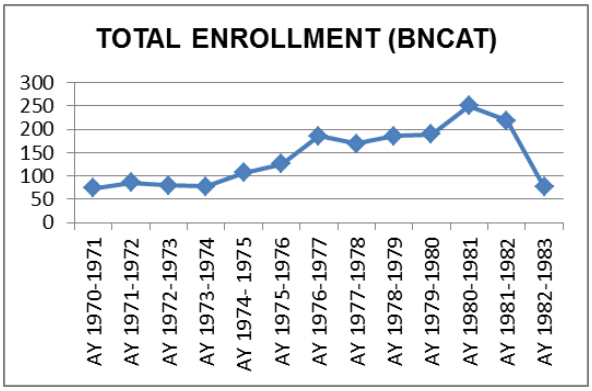


**Figure 2:** Total Enrolment (BNCAT)

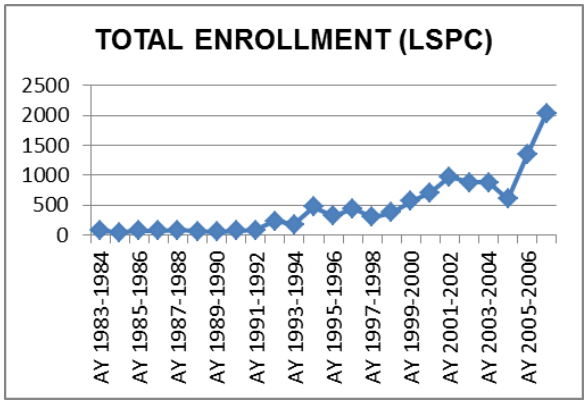


**Figure 3:** Total Enrolment (LSPC

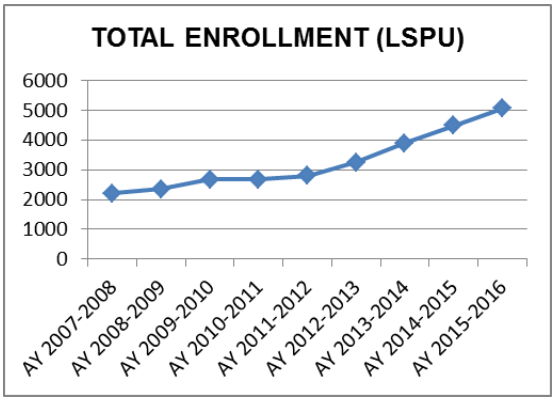


**Figure 4:** Total Enrolment (LSPU)

**Table 1:** Annual Growth Rate of Enrolment

| Transition Name | Year Inclusion | Legal Basis | Average Rate Enrollment | SD | Average Number of Enrollees | Percent Increase |
|---|---|---|---|---|---|---|
| Baybay National College of Agriculture and Technology | 1971-1982 | R.A.6327 | 5.13 | 28.46 | 140 (rounded) | *** |
| Laguna State Polytechnic College | 1983-2006 | R.A.482 | 24.97 | 58.34 | 457 (rounded) | 226.58 |
| Laguna State Polytechnic University | 2007-present | R.A.9402 | 10.85 | 6.37 | 3268 (rounded) | 614.80 |

**Difference between the enrolment trends of the university in different periods**

It can be gleaned from the table that significant difference exists between the enrollment trends in different transition periods of the university. The mean value of 3268 student enrollees infers that the period of becoming a university attracted large number of students to be in school. This can be associated to the development of the facilities; continuous promotion; additional program offered and progressive involvement of the programs in the accreditation process. Facilities are considered to be the most influential attribute in determining student enrollment decisions in Higher Education Institution (Lee, 2010, Meboob et al., 2012). Hence, facilities play significant role in the increasing trend in the enrollment rate of the university. In addition, the intense competitions in the higher education sector has moved some universities on becoming entrepreneurial-university and implement marketing strategies in recruiting students both locally and globally (Ming, 2010).

**Table 2:** Difference between the Enrolment Trends of the University in Different Periods

| Transition | Mean | Difference |
|---|---|---|
| BNCAT | 140[b] | Significant |
| LSPC | 457[b] | |
| LSPU | 3268[a] | |

*Computed Value = 99.61; P-value = <0.001*

The figures below identify the best fit curve for the enrollment trend of the university. The first figure shows that the trend of the enrollment is not linear. Since the trend pattern is not linear, line is not applicable to be the best fit for forecasting. In addition, the S curve cannot also be a best fit for the trend as it makes the forecast lower than the average trend which is not suited on the enrolment track. The quadratic trend model and exponential trend can be utilized as fit curves however; the exponential growth curve is not seen on the specific sub group data. Thus, the identified best fit model is the quadratic trend. The model is given by the quadratic equation: $Y(T) = 777.622 - 132.099t + 4.45328t^2$

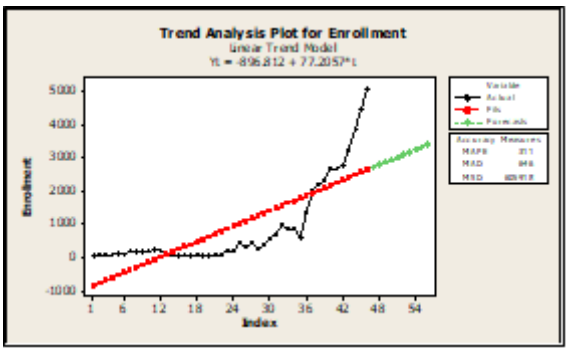


**Figure 5:** Linear Trend Model

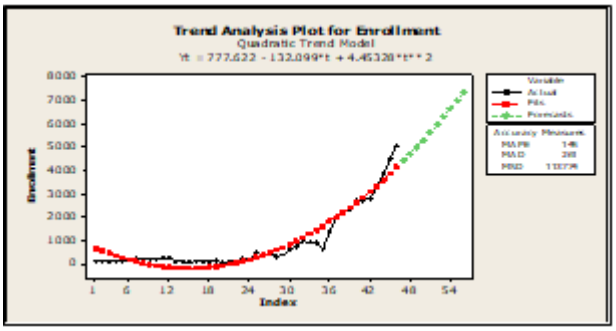


**Figure 6:** Quadratic Trend Model

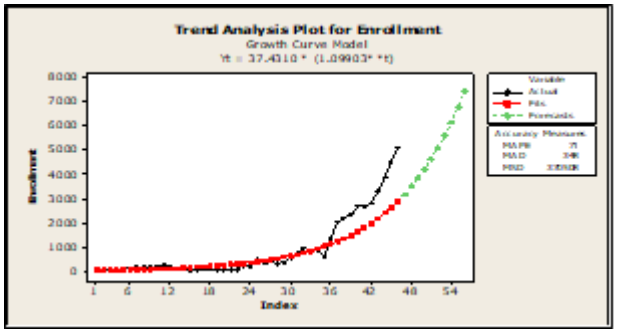


**Figure 7:** Growth Trend Model

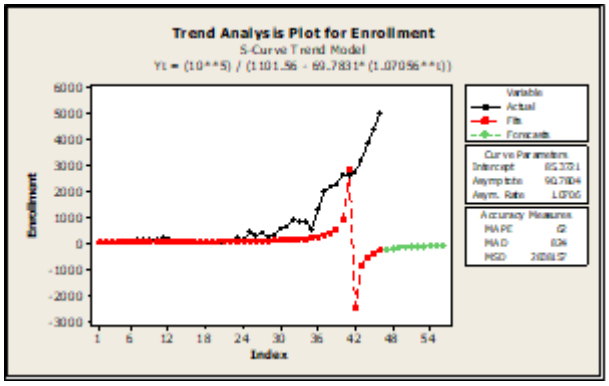


**Figure 8:** S-Curve Trend Model

Forecasts of enrollees on the next ten years presented in the table show that by Academic Year 2025-2026, the present enrolment status in the university doubles. This calls for the attention of the administrators in strategic planning.

**Table 3:** Forecasts of Enrollees in the next ten years

| Academic Year | Forecasts |
|---|---|
| 2016-2017 | 4406 |
| 2017-2018 | 4697 |
| 2018-2019 | 4997 |
| 2019-2020 | 5306 |
| 2020-2021 | 5624 |
| 2021-2022 | 5950 |
| 2022-2023 | 6286 |
| 2023-2024 | 6630 |
| 2024-2025 | 6983 |
| 2025-2026 | 7346 |

## 6. Conclusion and Recommendation

There is an increasing pattern in the enrollment rate of Laguna State Polytechnic University. The increasing pattern has different velocity measures when grouped according to transition periods. This study concluded that the increasing pattern in the enrollment follows exponential path. Hence, the predicted enrollment in the next decade calls for advanced innovation. The findings of the study suggest for advanced preparation on the part of the administration. Since, it was predicted that the present scenario in the enrollment will have the tendency of becoming double in the next decade; observations should be done in terms of faculty-student ratio, infrastructure, laboratory status, and equipment availability. In addition, results call attention on the establishment of more linkages on the part of the units concern to cater the graduates of the university for sustainable development.

## 7. Acknowledgment

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## Author Profile

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