A COMPARATIVE STUDY OF 10+2 LEVEL COURSES AND ITS IMPACT ON THE ACADEMIC PERFORMANCE OF THE STUDENTS STUDYING IN THIRD YEAR, BACHELOR IN COMPUTER APPLICATIONS

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ABSTRACT

The evolving needs of technical education compel students at the 10+ 2 level to adhere to meet the needs of the entry level eligibility criteria. Therefore students who are unable to pursue Higher Education (HE) in engineering and other technical disciplines now stand a chance to enhance their technical knowledge through educational programmes like Bachelors in Computer Science, Bachelors in Computer Applications (BCA) and Bachelors in Information Technology. BCA is one such programme offered at the Goa University in the ten colleges across the state of Goa. College courses are fundamentally different from high school courses and there needs to be a proper choice of subject courses at 10+2 level that will help students to bridge the gap and to meet the standards of HE (Conley et al, 2007). This paper seeks to ascertain the influence of a few educational attributes at the 10+2 level on the performance at TY in the BCA programme. It also intends to provide suggestions to students who intend doing HE in the BCA programme.

Keywords : Bachelor in Computer Applications (BCA), Mathematics (Math), Higher Education (HE), Computer Techniques (CT), 10+2 level, First Year (FY), Third Year(TY).

I   Introduction :

The objective of the BCA programme, is to produce employable IT workforce with sound knowledge of IT and business fundamentals that can be applied to develop and customise solutions for SMEs. It is based on Computer Science technologies and different kinds of programming languages (front end and backend tools).

The primary focus of this paper involves studying the BCA programme considering a student right from FY till the completion of the degree programme at the TY. The paper highlights the key attributes namely Math and computer knowledge at 10+2 level. A comparative study is carried out to provide suggestive indicators to students who intend pursuing HE in the BCA programme. The need for a freshmen course may arise to foster and build the capacity of a fresher at the 10+2 level.

Review of Literature :

To conduct the present study, a literature review was carried out to understand and learn the three major areas of computing domain in bachelor's degree in HE namely Computer science, Computer Applications and Information Technology. It is important to note that even though there are basic differences, but in many contexts the nature of the programmes are more or less similar as per the curricular study (Agarwal, 2007), (Gupta, D & Gupta N, 2012). The primary focus of this study includes the BCA programme only.

A study already conducted shows that a total of 171 Private Universities in India are offering BCA programme (Paul etal, 2017). The BCA programme being a three years duration degree, is available mostly in affiliating colleges. BCA is offered to all 10+2 irrespective of its stream (Paul etal, 2018).

II   About the Study

The present study explores the performance of students at 10+2 level from various backgrounds such as Science, Arts, Commerce and Vocational streams who take up BCA programme for HE. The academic

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performance of these students is then again analysed at the TY and a comparative study of the same is carried out. Additional factors such as Math and computer knowledge as a subject at 10+2 and its impact on the TY performance are considered.

Objectives :

A set of detailed core objectives of the study is given below :

1. The core objective of this paper is to do an in-depth analysis of the performance of students at the TY in relation to their prior education in the Science, Arts, Commerce, and Vocational streams at 10+2 level.

2. To investigate the performance of students in the TY, with Math as a subject and those without Math as a subject at 10+2 level.

3. To analyse the performance of students at the TY from the Commerce and Vocational Streams at 10+2 level.

4. To investigate gender differences in the performance of students at the TY.

5. To analyse whether there is a relationship between the performance of the students from the various streams such as Arts, Science, Commerce and Vocational at the 10 + 2 level and their respective performance at the TY.

6. To investigate the performance of TY students with computer knowledge and those without computing background.

Methodology :

The secondary data has been collected from reports generated from the system used by the officials of the Rosary College of Commerce and Arts, Navelim Goa.

Demographic Data :

Table 1: Demographic data of the sample.

At 10+2 level										
Total Sample size	Arts	Comm.	Science			Vocational				
			Math	Math + Computer Science	No Math	CT	MREEDA	CRM	ELEC	OFF. SEC.
273	17	94	34			128				
			22	02	10	122	01	01	03	01
Gender: Male students: Female students:						175 98				
Students with Math						147				
Students without Math						126				
Students with Computer Knowledge						127				
Students without Computer Knowledge						146				

Source: Secondary Data

Table 1 depicts the demographics of the student sample collected for the purpose of the study; the records of 273 students from the year 2012 to 2016 at 10+2 level and then at TY in the BCA programme.

III   RESULTS AND DISCUSSION

1. To investigate the performance of TY students from the different streams at 10+2 level.

H1: There is no significant variation in the groups of the different streams.

H2: The is a significant variation in the groups of the different streams

Table 2: Indicating the performance of TY students in the BCA programme from different streams at 10+2 level.

Stream	Mean Percentage	Standard Deviation	F ratio	P value
Arts	58.80%	6.07		
Science	71.79%	8.63		
Commerce	63.25%	8.96	10.64	.000*
Vocational	64.00%	9.23		

Source: Secondary Data   **Significant at 0.01 level**

Table 2 reveals that H1 is rejected and therefore the alternate hypothesis H2 is proved. There is a significant difference (F=10.64, p<0.01) in the performance of students from the Arts, Science, Commerce and Vocational Streams at the TY. Highest percentage is secured by students from the Science Stream (mean=71.79%), followed Vocational Stream (mean=64%), Commerce Stream (mean=63.25%) and the performance in the Arts Stream is the least (58.80%).

1.   To investigate the performance of students in the TY of the BCA programme with Math and those students without Math at 10+2 level.

H1: There is no difference in the performance of students at TY in the BCA programme who have math or without math at 10+2 level

H2: There is a significant difference in the performance of students at TY in the BCA programme who have math or without math at 10+2 level

Table 3: Indicating the performance of TY students in the BCA programme with Math and without Math

Background in Mathematics	Mean Percentage	Standard Deviation	T_{cal}	P value
With Mathematics	65.23%	9.44		
Without Mathematics	63.41%	9.22	1.607	.10*

Source: Secondary Data   **Significant at 0.1 level**

Table 3 depicts that H1 is rejected and therefore the alternate hypothesis H2 is proved. There is a significant difference in the performance of students at the TY. Higher percentage is secured by students with Math at 10+2 level (mean= 65.23%) while those without Math (mean=63.41%).

2.   To analyse the performance of students at the TY in the BCA programme from the Commerce and Vocational Streams.

H1: There is no difference in the performance of students at TY in the BCA programme irrespective from Commerce or Vocational Streams at 10+2 level

H2: There is a significant difference in the performance of students at TY in the BCA programme irrespective from Commerce or Vocational Streams at 10+2 level

Table 4 : Indicating the performance of students at the TY of the BCA programme from Commerce and Vocational Streams at 10+2 level

Streams	Mean Percentage	Standard Deviation	T_{cal}	Level of Significance
Commerce	63.25%	8.96	-.612	0.54*
Vocational	64.00%	9.22		

Source: Secondary Data   Significant at 0.1 level

Table 4 depicts that H1 is accepted which implies that there is a no significant difference in the performance of students at the TY in the BCA programme irrespective whether they are from Commerce or Vocational Streams at 10+2 level.

3. To investigate gender differences in the performance of students at the TYBCA examinations.

H1: There is no difference in the performance of students at TY in the BCA programme irrespective of their gender.

H2: There is a significant difference in the performance of students at TY in the BCA programme irrespective of their gender

Table 5 : Indicating performance of TYBCA students based on gender.

Gender	Mean Percentage	Standard Deviation	T_{cal}	Level of Significance
Male	63.99%	9.54	-.950	.34*
Female	65.11%	9.05		

Source: Secondary Data   Significant at 0.1 level

Table 5 depicts that H1 is accepted which implies that there is a no significant difference in the performance of students at the TYBCA level irrespective of their gender.

4. To analyse whether there is a relationship between the performance of the students from the various Streams at the 10 + 2 level and their respective performance at the TY in the BCA programme.

H1: There is no correlation between the performance of students at the TY in the BCA programme and that at 10 +2 level

H2: There is a correlation between the performance of students at the TY in the BCA programme and that at 10 +2 level

Table 6 : Correlation between performance at 10+2 level and TY in the BCA programme

Level of education	Mean Percentage	Standard Deviation	Correlation Coefficient
10+2 level	58.74%	10.36	.38*
TYBCA	64.39%	9.367	

Source: Secondary Data   Significant at 0.01 level

Table 6 depicts that there is a weak relationship between the performance of students at 10+2 level and that at the TY which implies that irrespective of whichever background the student comes from at the 10+2 level the student can pursue the course. Therefore there is no need of any freshmen course to pursue this BCA programme. Another observation is that, the performance of students' improves at the TY compared to their performance at 10+2 level.

5. To investigate the performance of students at the TY in the BCA programme with computing knowledge and those without a background in computing.

H1: There is no difference in the performance of students at TY in the BCA programme irrespective of their computer knowledge or not.

H2: There is a significant difference in the performance of students at TY in the BCA programme with computer knowledge.

Table 7 : Indicating the performance of TYBCA students with and without background in computing knowledge

Background in Computing Knowledge	Mean Percentage	Standard Deviation	T_{cal}	Level of Significance
With Computing Knowledge	64.0961	9.25375	-.483	.63*
Without Computing Knowledge	64.6452	9.48828		

Source: Secondary Data

Table 7 reveals that H1 is accepted and it is found that there is no significant difference in the performance of students at the TY in the BCA programme irrespective of their computer knowledge or not. Therefore the BCA programme is open to everyone irrespective of whether they have computing knowledge or not.

IV   Conclusion

The present study has revealed that the science students perform better than the rest; the sole reason being the Math as a subject at the 10+2 level. The Vocational students also have a basic Math knowledge which in turn helps them to perform better. It has also been observed that there is no considerable difference between students of Commerce and Vocational streams. This is observed moreover because of the fact that the BCA programme has combination of Computer and Commerce papers. The Commerce papers that serves to add domain knowledge and improves the students grades in these papers while the Vocational stream students having acquired the IT domain knowledge somehow score well in programming subjects but lag in Commerce subjects. This accounts for the above observation that there is no considerable difference in the performance of

students with either Vocational or Commerce background at 10+2 level.

There is no gender bias as both the male and female students perform equally better. It has been observed that there lies a weak relationship between the performance of students at 10+2 level and that at the TY, the reasons could be varying. It has been observed that students show more interest in HE as the environment being more conducive and the students are more matured by then. The guidance of their teachers during the course of the programme also has a positive effect. Besides timely submissions of the In - Semester and End-Semester components earmarked in the system that helps the students to improve their performances. BCA programme being a professional course offers various certifications, On – the -Job training, industrial visits and field trips which makes the entire experience an enriching one. Also the use of web – based technologies and software products for educational purpose is moving at a faster rate (A. J. Turgeon, 1997). Social media too are an integral part of e-learning and are a potential source for assignments and projects (A. Dalton, 2014), (Y. Liu, 2010). This in turn adds to the quality in performance and

effective Teacher-Student collaboration (Lyashenko M, 2016). All these factors set a positive effect which lead to the students performing better at the TY in the BCA programme. It has been also felt that the basic computing knowledge at 10+2 level has not been able to make a significant effect at the TY in the BCA programme. Hence the BCA programme needs to be made available to any student irrespective of their gender or whether they have a computing knowledge or not. However, those with Math background have an added advantage in programming and computing subjects of the BCA programme.

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