

Trend of Students' enrollment in newly introduced Technologies in Polytechnic institutes during 2000-2007

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Abstract

This research paper is about the trend of students' enrolment in New Technologies Introduced in Polytechnic Institutions of Pakistan under TEP II (Technical Education Project II) during 2000-2007 with the assistance of Asian Development Bank (ADB). As a modus operandi for this research, a proforma was developed for the Principals of polytechnic institutions and circulated among the respective Principals by mail service. Nine Principals from 02 provinces (02 from Khyber Pakhtunkhwa (KPK), 07 from Punjab) who were circulated the Performa responded through them. The study reveals that students' enrolment increased in 04 technologies: namely, Computer Information, Computer Hardware, Electronic Publishing and Electrical Technology; while enrolment trend decreased in Textile and Biomedical Technologies. The study shows uncertain enrolment trend in another 03 technologies: namely, Environmental Control, Automation and Office Management. A total of 1415 students were enrolled in 9 different technologies at 9 polytechnic institutions from 2000 -07. Among them 1093 students were awarded certificate/ degree from their institutions. Enrolment trend may improve in the coming years by providing job opportunities in these fields and by improving facilities in the institutions.

Keywords: *Trend, students, enrolment, technologies*

1. Introduction

ADB assisted TEP (II) was developed to increase the efforts of the public sector institutions for qualitative improvement and quantitative expansion through diverse inputs as well as to promote private entrepreneurs for establishing quality technical institutions.

The Project was initially scheduled to start in the first quarter of 1996 with an amount of \$ 60.0 million and to be completed in 06 years but the period was extended for another 02 years. As a result the project was closed on 30 June, 2004. The project focused on the up gradation of the existing polytechnics by revitalizing and modernizing polytechnic system. It also envisaged introduction of new technologies to meet the projected requirements of industrialization in Pakistan. In this program, it includes contribution of private sector in the medium level of technical education. The project also projected to support the supply of local and foreign consultants, local and foreign staff training, equipment, furniture, books and infrastructure development for the proposed new technologies.

2. Background and Literature Review

Technical Education is a sub-sector of the education sector which is at the post-secondary level. The objective of technical education is to prepare the youths to be competent in technical occupations. The history of technical education in Pakistan is 114 years old when the First Railway Technical School was

established in 1889. In 1953 it was declared a Government Institute and named as Government Technical Institute. In 1961, the Directorate of Technical Education, Government of the Punjab took control of this college and launched three years Diploma Course here, it was renamed as government Polytechnic Institute. Finally, 1974, it became a university, Bachelor of Technology courses were started here and it became Government College of Technology at Railway Road in Lahore. Another Institute of Technology was established in 1921 by a philanthropist; namely: Mr. Nadirshaw Edulji Dinshaw. It was meant for the training of technical workforce in the private sector. That was how it was known as NED Institute of Technology which was upgraded to an Engineering College in 1922 and was subsequently upgraded to NED University of Engineering and Technology in 1977 under the Education Policy 1972-80. A technical college Mughalpura, Lahore, was upgraded to West Pakistan College of Engg. Lahore in 1961 and subsequently raised to the status of a university called University of Engineering and Technology (UET), Lahore. A quantum boost to technical education was acknowledged under the Report of the Commission on National Education, 1959, which recommended one polytechnic institute at the Division level and one monotechnic institute each at the District level. Polytechnic Institutes were upgraded to colleges of technologies to conduct 4 years degree programmes in engineering disciplines but the colleges of technologies did not fair well and were ultimately reverted back to polytechnics. They survive today as such unlike the institutes of monotechnics. These lost their significance and were closed down except a few prominent ones.

Following the spirit of the Report of the Commission on National Education, 1959, two (2) Colleges of Engineering; one at Dacca in former East Pakistan and one at Lahore in former West Pakistan were upgraded to the status of universities in 1965. Along with the up gradation of 2 engineering colleges to the status of engineering universities, two agriculture colleges- one at Mymonsingh in former East Pakistan and one at Faisalabad in former West Pakistan were also upgraded to the status of universities during the same period. Alongside these, a University of Science was also established at the Federal Capital in Satellite town, a part of Rawalpindi, in 1965. Technical and professional education received another quantum jump in early 70s when 9 more technical professional colleges/campuses were proposed to be upgraded to the status of universities under the Education Policy, 1972-80. They were as under:

<i>A. Engg. Colleges/Campuses</i>	<i>to be upgraded</i>
i. NED College of Engg, Karachi	to NED University of Engg. & Tech. Karachi
ii. Mehran College of Engg, Jamshoro	to Mehran University of Engg. & Tech., Jamshoro
iii. College of Engg, Nawabshah	to University of Engg & Tech, Nawabshah
iv. Second campus of Engg, Taxila	to University of Engg. & Tech., Taxila
<i>B. Engg/Professional Colleges</i>	<i>to be upgraded/established</i>
v. Sindh Agriculture College, Tando Jam	to Sindh Agriculture University, Tando Jam
vi. An Engg.College with university of Multan	Now UET, Multan
vii. An Agriculture College with university of Multan	
viii. An Engg. College at Quetta	Now Khuzdar Engg. University
ix. A Medical College at Quetta	

The growth of technical & professional education in Pakistan got a positive jolt when private sector was mobilized to invest in education under the subsequent education policies since mid seventies. As a result, a number of engg. & medical Colleges have sprung up in the private sector when the private entrepreneur found the field of education very profitable for investment.

The Government has established various councils in order to control the quality of technical/professional education in the country, such as

- Pakistan Engg. Council for Engg. & Technical Education
- Pakistan Medical & Dental Council for Medical Education
- Bar Council for Legal Education

- Veterinary Council for Veterinary Education

In Pakistan more than 77 technical institutions (government colleges of technologies/ polytechnic / mono technic institutes) are working to make the nation through teaching and coaching the students in various technologies. The objectives of technical education described in The National Education Policy (1998-2010) were “To design the program of technical and vocational education in such a way that dual purpose of self-employment and availability of trained manpower for industry is served simultaneously as well as to develop, in students, the needed technical skills and desirable work habits”.

The aim of technical colleges was to train technicians and practical engineers, Since 1988, industries have been allowed to provide grants for industry—university joint research. A few universities have taken the opportunity to pursue financial support for cooperative research with industry for the purpose of innovative graduate training.

At present, technologies fulfilled the multifaceted demands of modern societies with increasing scientific contents. The engineers are being faced the challenges of technical progress promoted in industries. If they are not properly trained to deal with the changing environment of modern society they risk becoming outdated just after or even before leaving institutions. Therefore, the universities/institutions are advised to "reengineer" their educational programs in order to prepare professionals with improved intellectual background in order to face this new reality. Several recommendations have been made with respect to course contents and also on educational methodologies,

The introduction of new technologies is subsequent almost always to a decision taken by the productive sector without any discussion involving societal participation or concerns. Severe crisis are made on social institutions as a result of the strong and unexpected impacts produced by improvements and because they are not able to adjust themselves as quickly as it would be necessary. These are the cases of families, religious institutions, armed forces and universities.

The particular skills to enter and succeed in these workplaces have also changed considerably in the past two decades. Technical and technological skills remain vital, but they must be tailored and grounded in employees' ability to think of them in the context of the big picture (i.e., technical skills' role in knowledge and understanding of all aspects of the industry). Employers all the time discuss the importance of new skills essential to employees' ability to work effectively, such as knowing how to learn, interpersonal skills, competence in applying general education (reading, writing, calculating, computing) to workplaces, ability to work in teams, effective listening and oral communications skills, adaptability and flexibility, personal management skills with good self esteem, and personal & workplace ethics, leadership or initiative/ seemingly, above all-the ability to think, to solve problems in workplaces. Many of these skills were once reserved for those in management; today, they are considered essential for individuals of all levels of employment (Alpern, 1997; Clagett, 1997; Evers, Rush, & Berdrow, 1998; Secretary's Commission on Achieving Necessary Skills, 1991; Stasz, Ramsey, & Eden, 1995).

Technical Education

Technical education is a complete term referring to those aspects of educational processes involving, in addition to general education, the study of technologies and related sciences as well as achievement of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. According to the recommendations of General Conference of UNESCO, technical and vocational education is further understood to be:

- a. an essential part of general education
- b. a means of preparing for occupational field.
- c. an aspect of continuing education

Introduction of New Technologies

To promote market –driven technical education, the project (TEP II) supported the introduction of 30 new technologies in 30 selected institutions. These technologies were chosen based on the existing and emerging demands of the job market. Some of them were commonly taught technologies at institutions (computers, electronics and office management), while others were specific to provinces and institutions. To effectively implement these technologies, the Project provided necessary infrastructure, qualified teachers and other technical staff. In addition to workshops and labs for hardware technical training and demonstrations, computer labs were established in selected polytechnics for training in office management, computer skills, and information technology. With the help of consultants, NISTE developed TLR and curricula for the new technologies and prepared urgently a list of required equipment. The consultants, along with provincial and local experts, prepared 141 TLRs (textbooks, lab manuals, and reference guides). The TLRs were distributed to project institutions and libraries. The new curricula, TLRs and related instructional materials developed under the Project greatly broadened staff knowledge. They also benefited students through improved subject content and updated teaching practices that took into account the labor market needs. However, the real impact and benefits of the new curricula and TLR, as well as the new technologies was to depend on the quality of teachers, their training on the improved teaching methods and the effective use of new equipment.

3. Methodology

The objective of this research attempt is to find out the students' enrolment trend in nine new technologies introduced under Technical Education Project II in 9 polytechnic institutions in two provinces (KPK and Punjab) of Pakistan.

The present study is designed to find out the trend of enrolment in nine new technologies in 9 polytechnic institutions of Pakistan during 2000-2007; no study has yet been carried out on this issue. A proforma was developed to gather the data about students' enrollment from the Principals of 9 new technologies. This study used the students' enrolment data prepared by the Admission Sections of the respective polytechnic institutions.

Enrolment of students from 2000 to 2007 has been collected. Nine technologies out of 30 were introduced in 9 institutions of the two provinces of Pakistan. Two technologies were introduced in 2 institutions of KP while nine technologies were introduced in 7 institutions of Punjab. The analysis and the interpretation of data were also done where necessary. The data collected from the respondents were summed up. The data obtained were tabulated, analyzed and interpreted.

A total of 9 Principals of polytechnic institutions from 2 provinces (02-KP, 07- Punjab) were included in sample. The method of data collection for this research paper is the primary source i.e a set of proforma for principals. The sample comprises of 09 Principals of polytechnic institutions in Pakistan. The proforma was sent to the Principals of the respective institutions/colleges by post. The returns were then received in 90 days. Due to lack of time and financial constraints the study was delimited to 9 polytechnic institutions in two provinces of Pakistan i.e 02-KP and 07-Punjab.

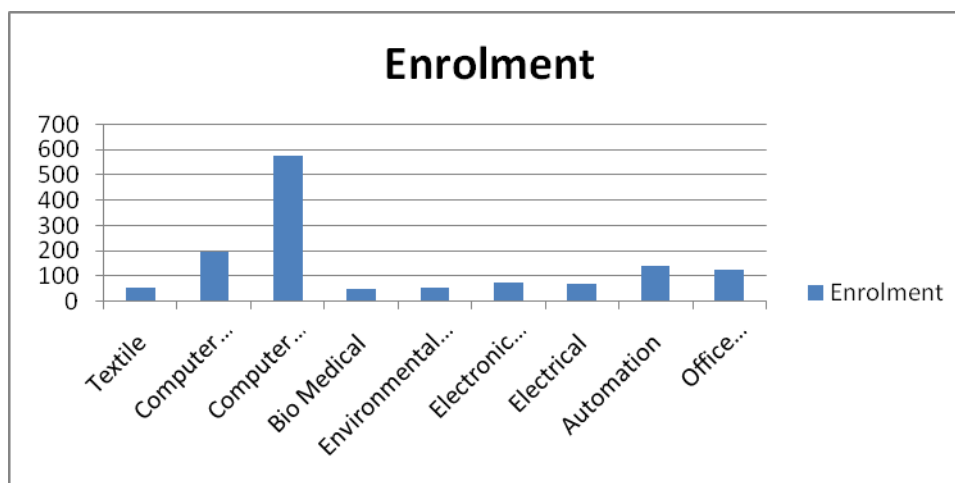
4. Findings

A total of 1415 students were enrolled in 9 different technologies at 9 polytechnic institutions from 2000 - 07. Among them 1093 students were awarded certificate/ degree from their institutions. The year wise students' enrollment pattern in different technologies of institutions have been tabulated and shown in graphs for visual convenience as follows:-

Tables and Graphs

Enrolment of students in technologies in 9 government polytechnic institutions of KPK & Punjab from 2000-07

Technology	Enrolment	Period
Textile	50	2004-07
Computer Information	194	2001-07
Computer Hardware	575	2002-07
Bio Medical	48	2004-07
Environmental Controls	52	2000-07
Electronic Publishing	69	2002-07
Electrical	65	2002-07
Automation	137	2002-07
Office Management	125	2001-07

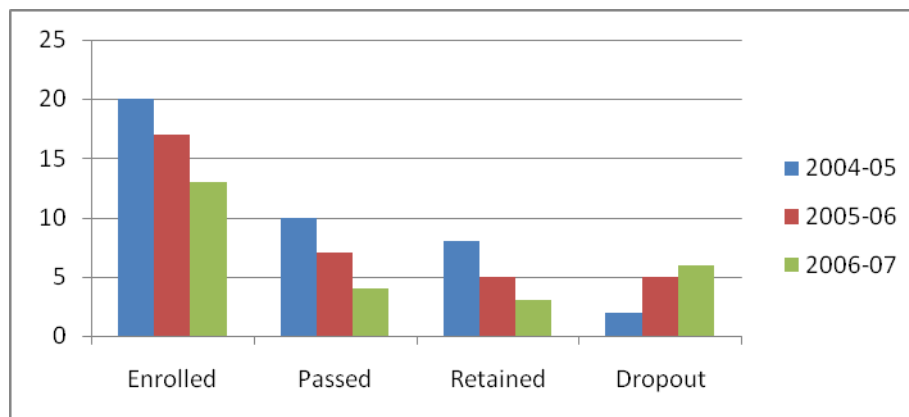


The graph shows the total strength of students in 9 technologies during the period 2000-07 which were 50 in Textile, 194 in Computer Information, 575 in Computer Hardware, 48 in Biomedical Technology, 52 in Environmental Control, 69 in Electronic Publishing, 65 in Electrical Technology, 137 in Automation and 125 in Office Management.

Students' enrolment in each Technology**Table: 1 Textile (Dyeing & Finishing)**

Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	-	-	-	-
2002-03	-	-	-	-
2003-04	-	-	-	-
2004-05	20	10	8	2
2005-06	17	7	5	5
2006-07	13	4	3	6

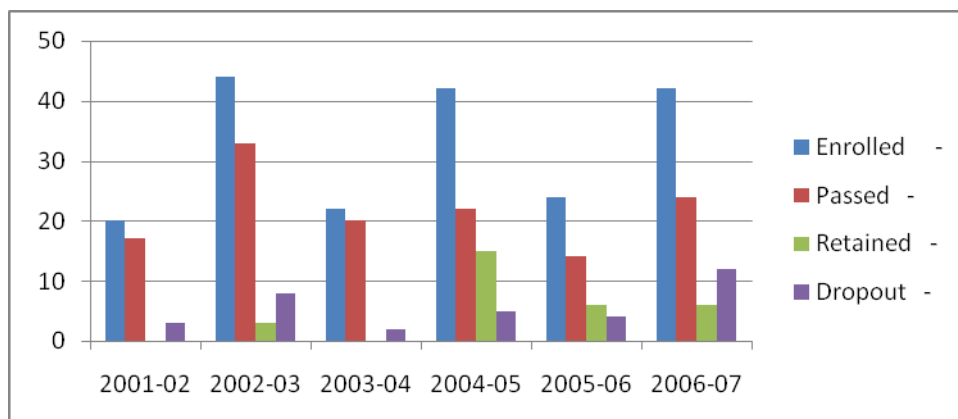
Trend of Students' enrollment in newly introduced Technologies in Polytechnic institutes during 2000-2007



Textile (Dyeing & Finishing) technology was introduced in 2004-05. A total of 50 students were enrolled up to 2007. Among them 21 students passed, 13 students dropped out during these years. Year wise data of students is shown in the graph. Student enrolment column reflects a decrease in admissions. Students did not show interest in this technology.

Table: 2 Computer Information

Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	20	17	-	3
2002-03	44	33	3	8
2003-04	22	20	-	2
2004-05	42	22	15	5
2005-06	24	14	6	4
2006-07	42	24	6	12



Computer Information was offered in 2001-02. A total of 194 students were enrolled from 2001-07, and 130 out of them passed this course during these years. In this way the pass percentage of students in this technology is 67%, while drop out rate is 34%. Year wise data of students are shown in the graph. The

graph showed that student enrolment in the launching year (2001-2002) was 20 which gradually increased in the later years as shown in the graph. Students' interest in this technology may increase in the future, with the increase in job opportunities.

Table 03 Computer Hardware

Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	-	-	-	-
2002-03	47	42	-	5
2003-04	96	87	-	9
2004-05	125	125	-	-
2005-06	153	141	-	12
2006-07	154	147	-	7

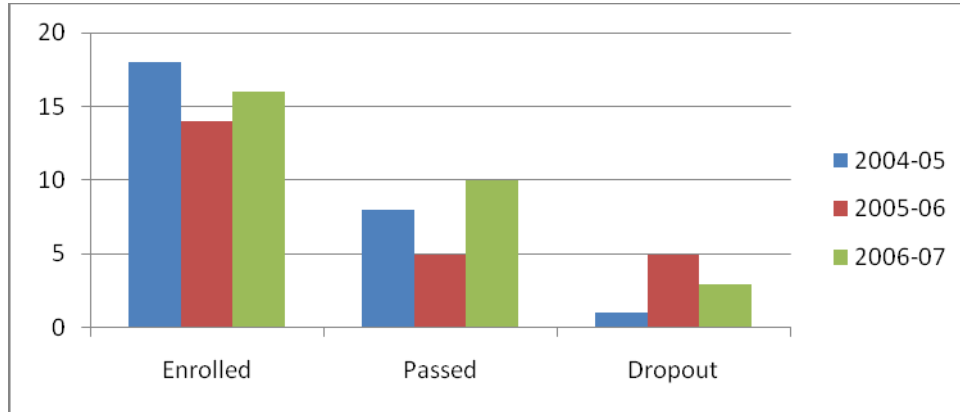


Computer Hardware technology was introduced in 2002-03. A total of 575 students were enrolled up to 2007. Among them, 542 students passed and 33 students dropped out during these years. Year wise data of students shown in the graph presents a high percentage of student enrolment every year in Computer Hardware as reflected in the graph. This showed that students were very interested in getting admission in this technology.

Table: 04 Biomedical

Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	-	-	-	-
2002-03	-	-	-	-
2003-04	-	-	-	-
2004-05	18	8	9	1
2005-06	14	5	4	5
2006-07	16	10	3	3

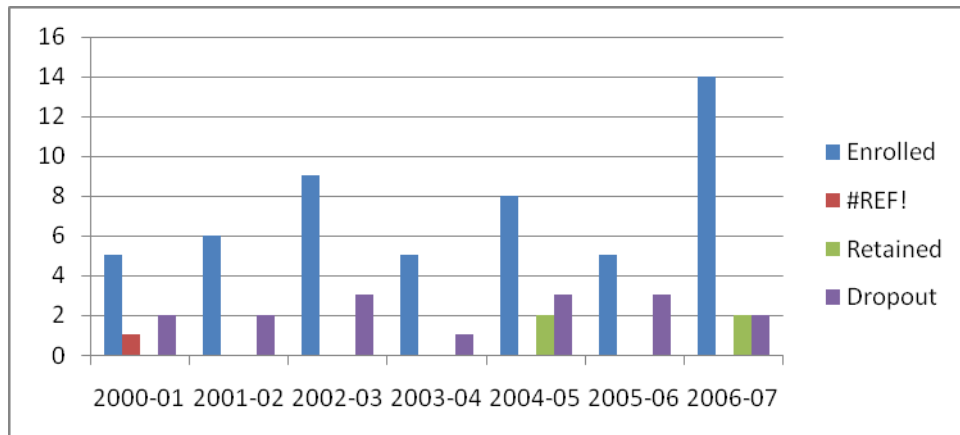
Trend of Students' enrollment in newly introduced Technologies in Polytechnic institutes during 2000-2007



This technology was introduced in 2004-05 with 18 students. During the period of 2004-07, a total of 48 students got admitted in this technology; 23 out of 48 passed the course while 9 students dropped out of the course. Year-wise data of students is shown in the graph. Students' enrolment during the period of 2004-2007 showed an uncertain situation. Less number of students was admitted in the starting year and the number further decreased in the later years as shown in the graph. The enrolment ratio was not satisfactory.

Table: 05 Environmental Control

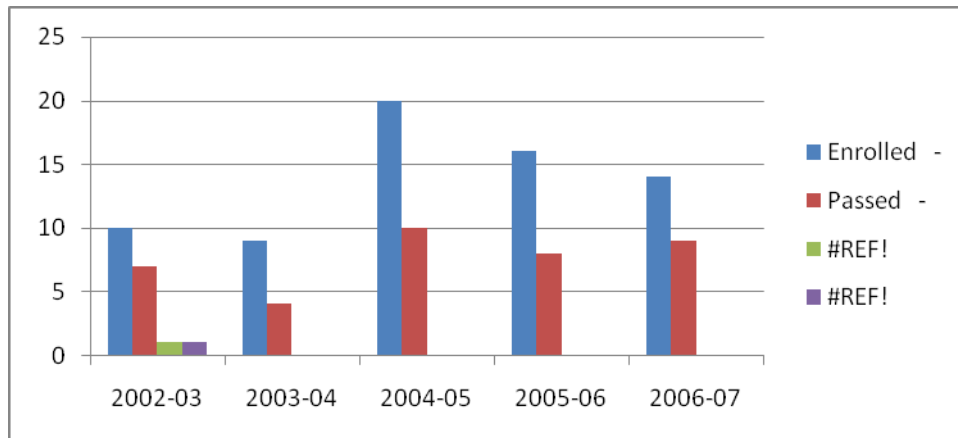
Year	Enrolled	Passed	Retained	Dropout
2000-01	5	3	-	2
2001-02	6	4	-	2
2002-03	9	6	-	3
2003-04	5	4	-	1
2004-05	8	3	2	3
2005-06	5	2	-	3
2006-07	14	10	2	2



The technology of Environmental Control started with 05 students in the beginning (2000-01) and a total of 52 students were registered in the course. During the same period 32 students qualified the course, while 16 students dropped out of the course. Year-wise data of students is shown in the graph. A negligible number of students (05) were admitted in 2000-20001(05). The number of students' admission in the later years increased a little. This reflected that the students were not very enthusiastic to get admission in the technology.

Table: 06 Electronic Publishing

Year	Enrolled	Passed	Retained	Dropout
2001-02	-	-	-	-
2002-03	10	7	2	1
2003-04	9	4	2	3
2004-05	20	10	2	8
2005-06	16	8	3	5
2006-07	14	9	2	3

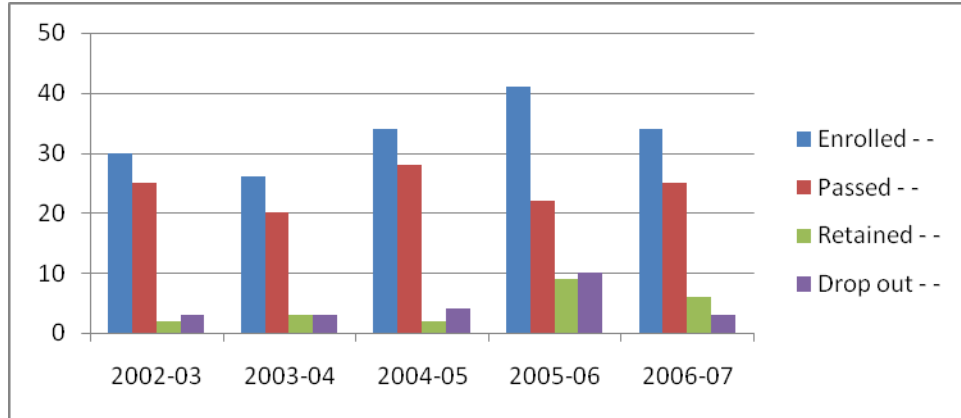


The total number of students enrolled in Electronic Publishing was 69 from the years 2002-2007. And pass percentage was 55 while 28.98% dropped out of the course during the same the years. Year wise data of students is shown in the graph. Increased enrolment of students every year showed that the students were motivated to take interest in this technology.

Table: 07 Electrical

Year	Enrolled	Passed	Retained	Drop out
2000-01	-	-	-	-
2001-02	-	-	-	-
2002-03	30	25	2	3
2003-04	26	20	3	3
2004-05	34	28	2	4
2005-06	41	22	9	10
2006-07	34	25	6	3

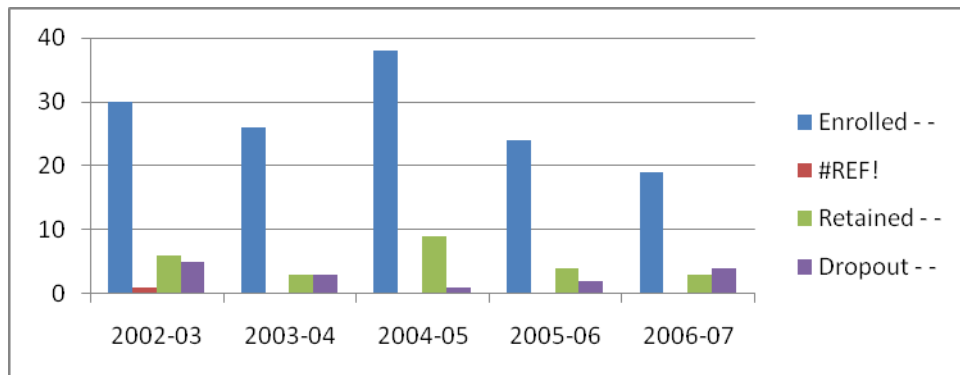
Trend of Students' enrollment in newly introduced Technologies in Polytechnic institutes during 2000-2007



The Electrical technology started with 30 students in the beginning year (2002-03) and a total of 165 students were registered in the course. During the same period 120 students qualified the course, while 23 students dropped out of the course. Year -wise data of students is shown in the graph. . High percentage of student enrolment every year in Electrical technology is reflected in the graph. This showed that the students were very interested in getting admission in this technology. Students were very enthusiastic and keen in getting admission in Electrical Technology.

Table: 08 Automation

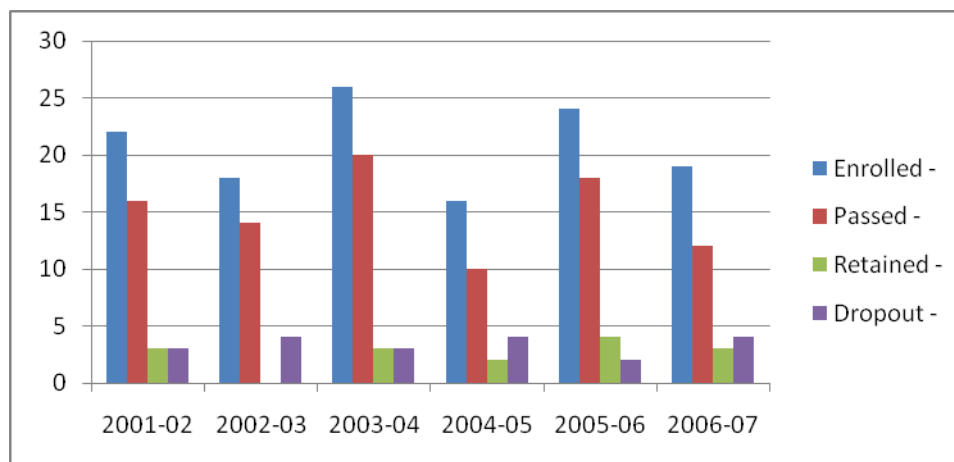
Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	-	-	-	-
2002-03	30	19	6	5
2003-04	26	20	3	3
2004-05	38	28	9	1
2005-06	24	18	4	2
2006-07	19	12	3	4



This technology was introduced in 2002-03 with 30 students. During the period 2002-07, a total of 137 students got admitted in this technology; 97 out of 137 passed the course, while 15 students dropped out from the course. Year - wise data of students is shown in the graph. The ratio of students' enrolment every year was uncertain. But the rate of admission was not very hopeless. The trend in admission gives a hope of increase in the future.

Table: 09 Office Management

Year	Enrolled	Passed	Retained	Dropout
2000-01	-	-	-	-
2001-02	22	16	3	3
2002-03	18	14	-	4
2003-04	26	20	3	3
2004-05	16	10	2	4
2005-06	24	18	4	2
2006-07	19	12	3	4



The total number of students enrolled in Office Management was 125 from the years 2001-2007. And 90 students passed out during the same period while 20 dropped out of the course. Year wise data of students is shown in the graph. Enrolment trend in the graph was not very promising. For example: admission increased in the session 2003-2004, while number of admission decreased in 2004-2005. Situation might improve in the subsequent years if job opportunities improved substantially.

4. Conclusions

The students took interest to get admission in the technologies introduced in technical institutions under TEP II (Technical Education Project II). Year - wise enrolment in a few technologies is high, like: Computer Information, Computer Hardware, Electronic Publishing and Electrical Technology. Students are more interested to get admission in these technologies. The reasons may be good market value, good faculty or facilities. Year - wise enrolment in 2 technologies is low, such as: Textile and Biomedical Technologies was low. The reasons may be low market value, difficult to get jobs in the relevant fields etc, while the year-wise enrollment in 3 technologies is uncertain, it was good in one year and not good in other years. Enrolment trend may improve in the coming years by providing job opportunities in these fields and by improving facilities in the institutions.

5. Recommendations

1. It is recommended that by introducing technologies such as Environmental control, Petrochemicals, Research Methodology in Polytechnics institutes, students' enrolment be increased in the future.

2. It is recommended that Students' enrollment be improved in the coming years by providing stipend during studies, good teaching faculty and improving facilities in the institutions. After the completion of degrees providing them jobs in these fields, loan on easy installments etc.

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