

# ENGINEERING EDUCATION BEYOND K - 12

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**Abstract:** *This Program was developed in accordance to the Educational Policy Decree Law 9394, December 1996, known as new LDB, through which the secondary school is compulsory but with exclusive feature to develop the educational background required to that level.. For the high school graduates, seeking for a job, either by economic pressure or by the lack of academic aptitude to go to the university, there is a limited alternative to adapt themselves to the demanded of the market place. The shortage of suitable programs and institutions offering job skills training devoted to the young graduates is noticeable. Each field of production of goods or services is demanding more and more for well trained technician to perform the job properly.*

*To solve this problem the public schools are open to organize and formulate new courses, through a partnership work with business enterprises, aiming to train technicians to supply the market demand. So a specific program "The Multimedia Technician Program" was planned in a collaboration with Advisor Committee, constituted by members of local enterprises, to train workers or students on computer technology for the widespread area of mass communication.*

## 1. Introduction

Curitiba, the Capital city of the State of Paraná, located in southern Brazil has hosted the advanced technology development program, aiming to improve the life standard of the population by attempting to create more job places. This made Curitiba to become a center of excellence for software development in South America. Presently, many companies are operating to develop software for several fields of application of ever growing business. This trend, not only in other parts of the world, but also in this country, the computer tools associated to the visual communication sector, started to take places in interactive games, educational software, tutorials or even complementing and amending audio visual matters, such as for TV, movies, theater, music broadcasting, etc., used mainly to attract the attention for details in products or services which need to be explored in advertisements and propaganda.

With the introduction of internet multimedia tools are demanded more frequently, and consequently the demand for skilled technician to perform job functions

of interaction of knowledge in computer tools, communication, advertisement, and marketing, are in an increasing demand. Through a survey on offices of selection of specialized human resources, informal interviews among firms which develop software for multimedia, and other means of communication that inform the position open, such as newspapers, services of offer and recruitment of job places via internet, the needs of technicians of broad knowledge in this specific area were in evidence. Upon this information, it has proposed to elaborate a program of a specific course to train technicians in areas of visual communication and to develop the computer tools for this purpose.

## 2. The program and its application

According to the recent Decree on Educational Policy, programs of skill training courses with two years of duration, divided into four semesters of 100 days each, are encouraged to be offered, beyond senior high school. These are to train the graduates from that level with interest or already working in the mass communication sector, using conventional means, such as radio broadcasting, TV, cinema, theater, and others. It also will suit to whom seeks to develop programs in communication using computer tools, such as developing software which use sound and picture as a main concept of functionality.

Technicians from this training program will be able to deal with computer information, integrated to sounds and pictures produced or worked by computer. The proposal is to present the best products or services to the community, making it available in the competitive market with real advantage of acceptance and recognition. Technicians must be able to develop by themselves or to modernize the design of existing product to adequate it them to the community goals. The job skills achievement will not be addressed to a specific area, but for a broad area which keeps the computer technology in communication or use it, or even aiming to deter the knowledge of new forms of mass communication, taking the advantage from it to stay in the market. Besides these features, technicians trained in this program, will have the orientation on enterprising principles, as presently the government offers some incentives to start small and medium size enterprises.

This is a post-secondary level program, thus it has the job training character, with small group limited to 24 students. In this group, candidates from the community and firms will be selected through entrance examination which encompasses the general knowledge to demonstrate the aptitude for a specific knowledge. Candidates must show the basic knowledge in oral and written communication, English, Mathematics, and basic knowledge in computer tools.

The skills on oral and written communication aim to evaluate how the future student will fit to the program as to minimize the drop out from courses, and also to avoid the candidates which signals the lack of aptitude to follow the program.

As the tasks performed by multimedia technicians will be of diverse nature, so the program intends to train them, not only for a specific task, but for a broad professional development. It also aims to promote the evolution of several ways to apply their knowledge in software development, image assembling, and the provision of sounds to the movies, video tapes, theater and TV broadcasting, apart from the traditional forms of designer. Thus there will be a vast job opportunities for a trained technician who is able to use and apply the creativity by using computer tools as the means of diffusion and promotion of products and services through mass communication.

### 3. The development of program

The program is elaborated to the professionals who make use the computer technology as a mean of work and to those students or workers who pursue creativity and beauty required by the entertainment business.

Thus, one goal of this program is to improve the artistic and cultural background of each participant. For this purpose, an interactive classroom was idealized with facilities available to the users, such as computers, drawing boards, video cameras, digitizers, TV and the connection to the worldwide internet, in order to encourage the discussion about diversified matters. An adequate physical dimension was planned with enough space for the mobility of students and tutors to allow them to stay comfortably on their own, to express their ideas, and their creativity to be approved, criticize as the critics and self assessment lead to the improvement of creativity.

Through this methodology, the program will be addressed to be more practical as possible and close to reality of every day life in the area of multimedia business. Thus, the facts to be pointed out as a didactic mean, will be also collected from the daily life and worked out by the groups as a way to stimulate the development of the tasks for results which suit the enterprise needs. In some cases, in spare time, real world matters can be developed by the members of the group which perhaps could get a profit to aid on program improvement for its enrichment.

## 4. The curriculum

The program includes compulsory subjects in the computer science, such as Introduction to Programming, Communication and Technology management. The program was planned for a duration of 2,200 hours, 1,800 in academic work load, including theoretical and laboratory activities added by 400 hours of practical training in the job market.

The proposal is that the disciplines carry themselves the interdisciplinary context, thus promoting more complete teaching-learning task. The blend of these subjects are to integrate and complement the knowledge required to perform the proposed program.

Not only the subjects must interact but it is expected that the main actors involved, students and tutors, complement each other in a continuous exchange of knowledge and experiences. The curriculum grid presents the tutor as a mediator, the interaction agent. Nowadays, there has no longer the place for a traditional feature of teachers lecturing in one side of the balcony and the students hearing them behind it. During the class session, students are encouraged to explain their own ideas to discuss among peers, which is the basic principle of this program.

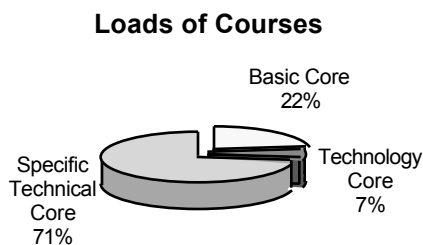


Fig. 1 - Distribution of core courses - the load distribution of core courses.

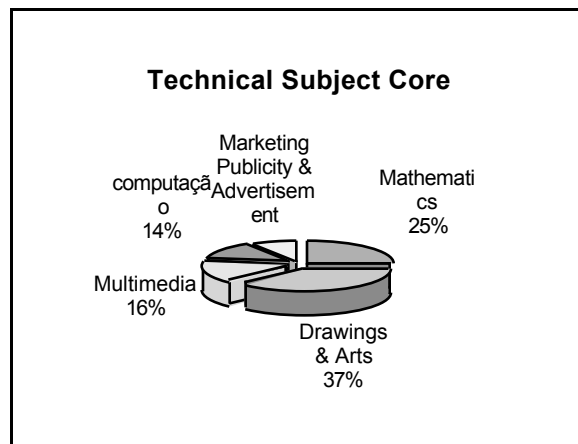


Fig. 2 - Distribution of technical core courses - the distribution of Technical Subject core courses.

Table I illustrates core and courses.

Table I - Core courses

CORES	SUBJECTS
BASIC CORE	Oral & Written Communication I & II
	English I & II
	Human Relations

TECHNOLOG Y	Introduction to Science & Technology
CORE	Management, Leadership & Ethic
	Technology Management

Table I- Continued.

TECHNICAL SUBJECT CORE	Descriptive Geometry
	Basic Drawings
	Computer Graphics
	Multimedia
	Logic & Programming
	Graphics Arts
	Programming Language - Visual Java
	Composition I
	Perspective
	Esthetic & History of Arts
	Application of Sounds - Sound Effects
	Marketing, Publicity & Advertisement
	Composition II
	Software Multimedia - Adobe Premier
	Drawings - Creativity

### 5. Advisor Committee and Academic Staff

The offer of skilled and able technicians in the field of multimedia demands the participation of enterprises to suggest, elaborate and supervise the course program to be more effective. The Advisor Committee is formed by a selected members among the enterprises operating in the field of proposed program, representative from class association and academic staff. The Advisor Committee will also participate in overall evaluation of the performance of the program at the end of each semester to suggest the changes for improvement to keep the program updated. Members of the Advisor Committee should have their experiences compatible in the field of the proposed program as this will have a strong influence on guidance to evaluate and to keep updated. They should have a commitment with a professional career, willing to participate actively on the proposed program for a skill training of technicians in multimedia.

The academic staff must present broad knowledge in the specific field of teaching, also pursuing experience in computer tools to the specialty enabling to promote clearly the interdisciplinary work and

make the students understand about the benefits of the use of computers in their career.

The academic staff must be very conscious about the interdisciplinary work for the set of disciplines proposed for training, having the possibility to offer guidance about the use of this methodology in the program. They also must be capable, on their own, to discuss their works and those developed by the group, knowing how to criticize and absorb critics, positioning as mediators in several cases of the collective or individual learning, supporting the creativity and proposals of students.

### 6. Conclusion

This program will be useful because it will provide another possibility on skill training to the youngsters who graduate from senior high school without any specific skill for the job market. Sometimes, the students have no interest or are not able to assume any financial commitment attending the College or University, which require a financial support. The program also aims to fill the gap between supply and demand, where the shortage of qualified technicians are acute and noticeable. This aims to offer the training in the field in which the graduates will be easily absorbed by the market, trained by means of innovative proposals.

This also could lead to start own business if financial support or subsidy is available to fund the enterprise endeavor. The professional independence is one those more prospective endeavor, as long as the actor can find the means to identify the niches of the market. One goal of the program is also to stress on initiation to enterprising in technology management.

### 7. Bibliographical Reference

- BORSATTO, D. O. & BUENO, N. L. & COLETTI, M. - 1997- *Planejamento do Curso Técnico em Multimídia* - Trabalho apresentado a disciplina - Planejamento de Educação Tecnológica - CEFETPR-PPGTE.
- MACIAM, L. M.. - 1987. *Treinamento e desenvolvimento de recursos humanos*. São Paulo: EPU.
- MEC. - 1991. *Regulamento da organização didático-pedagógica do CEFET*.
- SANDHOLTZ, J. - 1997. *Ensinando com Tecnologia: criando salas de aula centradas nos alunos*. Porto Alegre: Artes Médicas.
- SOUZ., P. N. P. & SILVA, E B. - 1997. *Como entender e aplicar a nova LDB*. São Pulo: Pioneira,.
- TYLER, R. W. - 1991. *Basic principles of curriculum and instruction*. The University of Chicago Press,
- VASCONCELOS, C. S. - 1995. *Planejamento - Plano de ensino aprendizagem e projeto aplicativo*. São Paulo: Libertad,
- VAUGHAN, T. - 1994.. *Multimídia na prática*. São Paulo: Makron Books.