

THE "UNIVERSIDADE NOVA DE LISBOA" M.B.A. PROGRAM

EVALUATION REPORT, JUNE, 1981

1. Participants and terms of reference
2. Problems of implementation
3. Conclusions and recommendations

1. PARTICIPANTS AND TERMS OF REFERENCE

1.1. Participants

An evaluation of the above mentioned program was carried out during the period 3-5 June, by the following team:

Donald Finberg	A.I.D.	Lisbon
Michael Lukomski	A.I.D.	Lisbon
Prof. Irwin Friend	Wharton School	Philadelphia
Prof. Ronald Lee	I.I.A.S.A.	Viena
Carlos Barral	U.N.L.	Lisbon

The above team was assisted by the following members of the M.B.A. faculty:

	<u>School</u>	<u>Discipline</u>	<u>Trimestre</u>
Prof. Ant3nio Pinto Barbosa	U.N.L	Macroeconomics	1st.
Prof. Marten Estey	Wharton School	Personnel Management	3rd.
Prof. John O'Shaughnessy	Graduate School of Business Columbia University	Business Policy & Strategic Marketing	3rd.
Prof. Randolph Westerfield	Wharton School	Advanced Finance & Forecasting	3rd.
Prof. Diogo Lucena	U.N.L.	Decision Theory	3rd.

1.2. Terms of reference/brief

- Review progress achieved in relation to objectives.
- Identify difficulties in implementing plans to achieve objectives.
- Review objectives for validity and relevance.

The objectives of the M.B.A. program for the academic year 1980-81 were as follows:

- A) Set up a program equivalent to that of the best American business schools taking into consideration the specific needs of the Portuguese business community.
- B) Establish an institutional relationship with a reputable American business school securing support on the following main areas
  - curriculum design
  - selection and recruitment of foreign faculty
  - development of Portuguese faculty
- C) Set up selection criteria for the applicants to the M.B.A. program to achieve a quality level equivalent to that in top American business schools.
- D) Ensure that the Portuguese faculty in addition to competence in the subject area have an adequate "business orientation".
- E) Ensure that the premises are adequate for class-room work and provide suitable office space for the faculty as well as offer good logistics for liaison with the business community.
- F) Disseminate information on the M.B.A. among the business community to establish high credibility for the program and active support from the community: this support not to be restricted merely to financial considerations but to other areas like case study preparation, training within the firm and employment of MBA graduates and so on.

## 2. PROBLEMS OF IMPLEMENTATION

### 2.1. The selection of applicants

A committee of 4 from the School of Economics selected 45 candidates from a pool of 116 applicants. A ceiling on the number of admissions had been previously set at 40 students.

The selection criteria was composed of 5 factors weighted for relative importance on a scale from 1 to 5 viz:

i)	past academic performance	weighting factor	4
ii)	GMAT score	" "	5
iii)	work experience	" "	3
iv)	the letter justifying admission request	" "	1
v)	the age of the applicant	" "	2

Appendix I gives background details of the applicants and those selected, as well as information on GMAT scores.

All faculty members assessed the student body to be of superior ability. The following quotations were taken from the reports of Professors James Walter, Ronald Lee and Benjamin Katz - included as appendices II, III and IV -

"Student quality is - on balance - good. The top half of the class is on par with the top half at the Wharton School".

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"Student effort surpassed that to typical Wharton M.B.A."

*James Walter*

"The students in this M.B.A. group are undoubtedly very bright and easily able to comprehend theoretical material".

*Ronald Lee*

"The students in my class were of excellent calibre and their selection, with the use of GMAT scores and other criteria, provided a group easily comparable to M.B.A. students in the U.S. in their ability to learn the material required".

*Benjamin Katz*

## 2.2. Recruitment of Portuguese faculty

The first trimestre was taught by Portuguese faculty only. The result was, with the exception of Macroeconomics, not entirely satisfactory because of the short time available for relevant course preparation.

For the forthcoming M.B.A. program more attention will be paid to the adequacy of course content for a "business" oriented program. Greater emphasis on case studies is recommended.

For the medium/long term horizon it is imperative to develop Portuguese faculty trained in the U.S. . It is recommended that a "business orientation" be required of candidates - say, an M.B.A. and/or professional experience - to be complemented by a Ph.D. in the area of business. The Wharton School will assist in such training.

In the context of the discussion on the future need for Portuguese faculty, the pros and cons of a "Portuguese only" faculty were discussed; the concensus of opinion being along the following lines:

- i) the maintenance of a connection with a top U.S. business school would be a positive factor for the prestige of the program among the local business community as well as in other countries - particularly in ex - portuguese colonies - which may consider Portugal a suitable place for their M.B.A. candidates.
- ii) securing the cooperation of one or two top level business professors in each program would enable the school to offer both the business community and the alumni an opportunity to get acquainted with the latest "state of the art"
- iii) we should defer having a purely Portuguese faculty and maintain a few foreign professors in the M.B.A. program though the limited time horizon for the continuation of A.I.D. financial support and the need to obtain other sources of financing foreign professors was acknowledged to be a complicating factor.

### 2.3. Premises

Although the premises look impressive and are adequate for current requirements, class rooms are inadequate for classes in excess of 35 students even though such larger classes are inevitable with growth.

The conference room could and should be adapted for use as a class room and attention paid to adequate partitions and heating/ventilation facilities.

### 2.4. Foreign faculty

The recruitment of suitably qualified foreign faculty proved difficult partly due to too short notice and the time required to get approval from A.I.D..

Both the Wharton School and the A.I.D. representatives became aware of each other's difficulties and improvements can reasonably be expected.

The possibilities of contracts covering consecutive M.B.A. programs will be explored, as well as the possibilities of foreign professors teaching i) the same course twice - to different groups of students; ii) a condensed version for an executive M.B.A. program; iii) subjects in their area of specialization at executive seminars.

The school will investigate the possibility of securing apartments for the foreign faculty, for more than one trimestre, aiming at more convenient and less expensive lodgings.

### 2.5. Computer lab.

The need to secure continuity in the progress made so far was established and the school was urged to look into the possibility of contracting on a more permanent basis suitable people to ensure adequate programming and program maintenance.

The possibility of connecting one of the existing terminals with a larger computer, capable of running software packages like SPSS, SAS, TSP and ESP, requires further study.

Appendix V deals with this subject: "Access to outside computer capacity", a memo from Prof. Ronald Lee to the Director of the M.B.A. program.

## 2.6. Business community liaison

The support given so far by the business community has been very encouraging; contacts with the management of banks and a small number of large private companies resulted in financial grants amounting to some esc. 6 million (\$100,000) and many others have expressed their willingness to cooperate with the M.B.A. program. The contributions have largely taken the form of scholarships for chairs (esc. 300,000 per year) and/or for students (esc. 90,000 per year). The National Development Bank offered esc. 1.2 million for the equipment of a computer laboratory.

Financial aid from the business community will become an essential factor for the continuation of the program as A.I.D. support will be phased out at the end of the third consecutive M.B.A. program.

Contacts with the business community must become a regular feature of the school and the creation of Advisory Boards, to which prominent members of the community will be invited, was recommended. The creation of functional boards - General Management, Finance, Marketing, Personnel - was regarded as preferable to having a single Advisory Board.

The idea of regular "business lunches" enabling business leaders to meet the faculty was considered sound and a good way to promote both the development of consultancy work and the suitable placement of M.B.A. graduates.

The possibility of having teams of two or three M.B.A. students analysing specific problems in firms, as part of their M.B.A. requirements, was also considered worth exploring.

Executive programs of the type currently being organized by the School should take place on a regular basis; in addition to their financial and promotional interests they help acquaint foreign faculty with local business conditions.

## 2.7. Library

The current situation is unsatisfactory and needs to be corrected. Lists of periodicals and important books will be prepared by the current faculty to enable the prompt placement of orders taking into account the budgeted funds available.

Consideration should be given to the possibility of training the present librarian in modern library management and procedures.

The library facilities - space, lighting etc. - were regarded as adequate.

## 2.8. Medium/long term financial aspects

A.I.D. representatives stressed the need for additional sources of finance. As the main need for foreign finance is the recruitment of foreign faculty, the problem would eventually disappear when a fully Portuguese faculty take over. However, even assuming that this is possible in (say) five years, the intensity of the financial effort required during this period - to pay for foreign faculty and to enable an adequate number of Portuguese future teachers/scholars to be trained abroad - exceeds available resources. Having foreign professors in the M.B.A. program, in the long run, helps prepare Portuguese faculty and represents a positive factor in the attractiveness of the Portuguese M.B.A. to non-Portuguese - mainly ex-colony - students. The presence of foreign faculty imparts an international character to the program and facilitates the development of its support by the local business community as well as alumni to whom such faculty bring the opportunity for up-dating.

## 3. CONCLUSIONS AND RECOMMENDATIONS

The team considered that the main objectives of setting up a suitable M.B.A. program, comparable to those of the top American business schools, securing an institutional relationship with one of these schools and selecting a student body of adequate quality have been achieved.

It may be necessary for some of the Portuguese faculty to ensure that the "business orientation" is adequately reflected in their courses. "Management Accounting" and "Mathematics" appear to have had shortcomings in this respect. To avoid unnecessary overlapping with the "Introduction to Management", "Business Policy" and "Personnel" courses, the "Social Psychology" course needs some restructuring.

Teaching "Microeconomics" to students with different educational backgrounds presents a problem of balancing the theoretical content of the course with keeping the interest of the students.

"Macroeconomics", on the other hand, has given rise to no such problem because of the orientation of the course.

Objectives in terms of premises and liaison with the business community have partly been achieved: there is still room for improvement in class room facilities - heating, ventilation, larger rooms - to make life at the school somewhat more congenial; the M.B.A. program though given credibility and support by the business community still requires intense effort by the Management of the School to retain and cement the relationship.

The following are priorities for the immediate future:

- Maintaining quality requirements, selecting highly motivated people and increasing the diversity of the students body
- set up a plan for the preparation of Portuguese faculty through Ph. D. training offered to suitable M.B.A. graduates
- ensure an appropriate "business orientation" is adopted in all courses
- a minimum permanent faculty - say 3/4 teachers with adequate qualification - is essential for continuity and for starting up research activities within the school; such a faculty will also assist in activities aimed at the business community, a task to which attention must increasingly

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be paid

- when contracting foreign faculty the possibility of obtaining for the school the option to a second year deserves investigation
- foreign faculty must be willing to participate in executive programs, in addition to teaching at the M.B.A.
- access to larger computer facilities is important, particularly to ensure research capabilities as recommended above
- set up a series of functional advisory boards - General Management, Finance, Marketing, Personnel - on a two year rotating basis
- significantly increase the number of executive courses/seminars
- the library to be turned into a more useful teaching and research tool: this requires acquisitions of periodicals and books and proper training of the librarian.

NOTES ON THE "SELECTION OF APPLICANTS"

1. GENERAL DATA

- Number of applicants 116
- Selected 45
- Actually enrolled 40
- Currently active 34
- Full-time 22, part -time 12
- Of the 22 full-time: 15 will most probably terminate all exams by July next; 2 may be able to terminate (have failed one discipline during 1st trimestre) ; 5 will have to come again next year
- 17 of the current students are likely to come again in 1981/82

2. COMPARISON BETWEEN "APPLICANTS" AND "SELECTED" AGE PROFILES AND BACKGROUNDS

[ 7 ]

AGE	"APPLICANTS"	"SELECTED"
20-24	18	31
25-29	31	31
30-34	20	18
35-39	16	13
40-44	8	2
45-49	6	2
>50	1	2

BACKGROUND	"APPLICANTS"	"SELECTED"
Engineering	29	33
Management	22	31
Economics	17	22
Finance	7	-
Law	5	2
German Philology	3	2
Other Univ. Degrees	5	2
Without Univ. Degrees	12	8

**3. UNDERGRADUATE SCHOOLS ATTENDED BY THE SELECTED CANDIDATES**

. Engineering: "Instituto Superior Técnico	10
Lourenço Marques (Mozambique)	1
Military Academy	2
Oporto School of Engineering	<u>2</u>
	15
. Management: Catholic University	7
Lisbon Agronomical Institute	3
"Instituto Superior de Economia"	1
"Inst.Sup.C.T. e Empresa"	1
Paris (Dauphine)	1
Lauzanne	1
Maryland	<u>1</u>
	15
. Economics: Catholic University	4
Oporto School of Economics	3
"Instituto Superior de Economia"	1
School of Economics (Univ.Luanda)	1
London School of Economics	<u>1</u>
	10
University of Lisbon School of Law	1
University of Lisbon School of Science	1
University of Lisbon School of Arts	1

**4. SELECTION CRITERIA**

Five parameters (A to E below) were considered, each one being classified on a 1 to 5 scale and given a different weighting factor, viz

A - Academic performance	weighting factor	4
B - Professional experience	" "	3
C - Letter requesting admission	" "	1
D - GMAT	" "	5
E - Age	" "	2

The classification for each parametre was established as follows:

**A - Final classification of undergraduate course**

10 - 12	.....	1
13	.....	2
14	.....	3
15	.....	4
16 - 20	.....	5

B - Less than 2 years of professional experience	0	1	2
From 2 to 5 years	2	3	4
Over 5 years	3	4	5

In each case the choice among the 3 values was based on the nature of the experience

C - The factors considered were: maturity and self confidence; quality and presentation of arguments; style and originality.

D - GMAT, based on "overall percentage"

25 - 39	1
40 - 54	2
55 - 69	3
70 - 84	4
85 -100	5

E - Age

up to 25 years of age	2
from 26 to 30	4
from 31 to 35	5
from 36 to 40	3
above 40	1

GMAT DISTRIBUTION

SCORE	APPLICANTS		SELECTED	
	Number	%	Number	%
200 - 249	6	5.6	-	-
250 - 299	14	13	-	-
300 - 349	15	14	-	-
350 - 399	24	22.4	4	8.9
400 - 449	20	18.7	15	33.3
450 - 499	14	13	14	31.1
500 - 549	9	8.4	8	17.8
550 - 599	0	0	-	-
600 - 649	4	3.7	4	8.89
650 - 699	1	0.9	-	-

GMAT DISTRIBUTION (CUMULATIVE)

SCORE	APPLICANTS		SELECTED	
	Number	%	Number	%
up to 250	6	5.6	-	-
up to 300	20	18.7	-	-
up to 350	35	32.7	-	-
up to 400	59	55.1	4	8.9
up to 450	79	73.8	19	42
up to 500	93	86.9	33	73
up to 550	102	95.3	41	91.1
up to 600	102	95.3	41	91.1
up to 650	106	99	45	100
up to 700	107	100	-	-

5. GMAT

ANALYSIS OF GMAT RESULTS FOR "APPLICANTS" AND "SELECTED" CANDIDATES

	"Applicants"	"Selected"
Arithmetic mean	393.5	472.9
Standard deviation	96.2	63.7
Smallest value	218	391
Lower decile	273	401
First quartile	325	421
Median	386	465
Third quartile	460	507
Upper decile	512	573
Largest value	670*	647

*\*Three applicants with result above 647 have dropped their application*

6. RESULTS ACHIEVED DURING THE FIRST TWO TRIMESTRE VS. CLASSIFICATION OBTAINED ON DIFFERENT SELECTION PARAMETERS

The following table indicates, for the first 10 students of the course (based on the average classification on all courses taught in the first and second trimestres) their current age, educational background, GMAT score and classification for each one of the selection parameters.

RESULTES ACHIEVED SO FAR VS CLASSIFICATION DURING SELECTION PHASE

Ranking	Background	Age	GMAT	A*	B*	C*	D*	E*
1st	Economics	30	507	3	3	3	3	4
2nd	Management	27	507	5	4	2	3	4
3rd	Management	25	465	4	2	3	2	2
4th	Management	23	614	4	2	3	5	2
5th	Management	22	544	3	0	3	4	2
6th	Economics	22	488	3	1	3	3	2
7th	Engineering	25	609	5	0	3	5	2
8th	Engineering	24	609	5	1	3	5	2
9th	Engineering	34	437	4	3	2	2	5
10th	Management	26	484	2	2	1	3	2

Memorandum to: Carlos Barral

From : James Walter

Subject : MBA Program, Universidade Nova de Lisboa

The following remarks relating to my teaching experience in the MBA program, Universidade Nova de Lisboa. Generally speaking, the problems encountered were notably fewer than I anticipated.

1. Course Coverage.

The course (Finance) was designed to cover ~~much the same ground~~ as the first course in Financial Management at the Wharton School. The same text (Weston and Brigham) and problem set were used. The emphasis was modified somewhat to take account of differences between Portugal and the United States. Cases included (1) Transport Systems Inc. (company goals), (2) ARMCO (strategic, financial planning), (3) Milgo (forecasting), (4) Acidex (capital budgeting), (5) Shannon (capital structure), and (6) Holiday Greetings (comprehensive).

2. Student Quality.

Student quality is - on balance - good. The top half of the class is on a par with the top half at the Wharton School.

3. Student Effort.

Student effort surpassed that of the typical Wharton MBA. Assignments were consistently prepared, with some slackening off subsequent to the midterm. Case preparations by teams were generally well done (although rarely imaginative). Consistent preparation was essential to superior performance in the Finance courses.

#### 4. Facilities.

The facilities are impressive. Faculty offices are more than adequate. The classroom space is cramped, suggesting that further attention needs to be given to the best use of facilities.

High priority, on the list of things yet to be done. should be given (1) the development of the library (especially, in the area of periodicals); (2) the creation of a financial and economic data base relating to Portuguese companies and to the Portuguese economy; and (3) the acquisition of an adequate statistics package for the computer processing of such data.

#### 5. Conclusion.

The M.B.A. program has made substantial progress and appears to be a viable operation. Carlos Barral has achieved wonders in a short period; he does, however, need help in administrating the program. Longer run issues that merit considerable attention include (1) provision for an ongoing faculty and (2) regularization of contacts with the business community.

As a member of the first wave of visiting faculty, I am pleased to have participated in the early development of the M.B.A. program.

Evaluation of Teaching Experience

School of Business, New University of Lisbon,

Winter Semester, 1981

Ronald M. Lee

20 April, 1981

Overall

This semester proved for me to be very interesting and very exhausting - both are to be expected in starting a new school.

On our arrival, the school moved into its new quarters in the mansion at # 20 Marquês da Fronteira on the week-end before classes started. Thus, many things were in a state of flux, which only gradually settled down as the semester proceeded.

A special note of credit must however be given to Carlos Barral for his skill at organizing and facilitating amidst severely constrained and confused circumstances.

In the pages to follow, I will comment on the outcome of the two courses I taught, statistics and management, followed by some general comments on the students, the curriculum and development plan for the school.

## STATISTICS

In the U.S., statistics is often the 'scare' course of the required courses in an MBA program. Furthermore, the material one usually has time to cover in a first course (probability, distributions, hypothesis testing), is in itself not especially applicable to business problems, but rather serves as a basis for understanding more advanced topics - e.g. econometrics, stochastic programming, decision theory.

My expectations before arriving here was that the Portuguese students would, if anything, be even less likely to have had mathematical background than their American counterparts. Further, given that this program has only one semester of electives rather than two, they would be less likely to be taking more advanced courses requiring statistical theory. Also, given that the scale of Portuguese business is much smaller than in the U.S., and is much more regulated (e.g. fixed prices, import quotas for each firm, etc.), I expected that there would be less of a market for mathematically trained MBA's.

Thus, in terms of a balance between the two courses I would be teaching, I considered the management course to be the more important, and intended to teach statistics at a theoretically superficial level, emphasizing problems and the identification of business situations where statistical methods would be applicable. Also, I intended to make use of the computer as a basic teaching tool for statistics - attempting to break the traditional association of formal decision methods with tedious calculations.

The principal textbook (Parket, Statistics for Business Decision Making), was therefore chosen because of its non-theoretical, problem-oriented approach. The secondary text (Afifi and Azen, Statistical Analysis: A Computer Oriented Approach), covered similar material, relating it to the routines contained in the more common computer statistical packages.

My first assumption, about the students mathematical background and aptitude, turned out to be entirely wrong. Most students, coming from engineering or economics, had a <sup>more</sup> substantial mathematical background - more than is typical among U.S. MBA students. Further, more than half the class had had statistics before; indeed three were statistics

instructors at the undergraduated level.

This fact changed the orientation of the course substantially. The students found no challenge at all in plugging numbers into formulas, and asked many questions about the theoretical justification of the methods. In response to this, I began covering the material at a much more theoretical level in my lectures than was done in the text. Provided that subsequent MBA classes have a similar type of background, I suggest using a more substantial statistics text such as Hamburg, Statistical Analysis for Decision Making or Hay and Winkler, Statistics: Probability, Inference and Decision.

As regards use of the computer as a teaching device, the Afifi and Azen text did not arrive, and the computer lab was only begun during the semester so that programs were not ready until later in the course. Students did use the computer to calculate descriptive statistics, correlation and simple regression, though the computer could be exploited much more effectively as further software becomes available.

As a final comment, I regret that I was not able to cover more topics in the time available. I only had time to introduce the concepts of regression and correlation and did not cover at all either non-parametric methods or Bayesian analysis. On the other hand, this is an ambitious goal for an 11 week course (considering time out for vacations and field trips) and few other introductory courses reach these topics either. Also, time was spent at the beginning of the course discussing elementary decision theory (payoff matrices, decision trees) and, because of student interest, hypothesis testing was treated in much more depth than I originally intended.

## MANAGEMENT

As mentioned in the previous section, management was to me the more important and relevant of the two courses I taught, and it was there that I invested the larger part of my preparation energies.

My basic objective, as indicated on the syllabus, was to survey the various perspectives and theories about management, try to find a synthesis between them where possible, and further to evaluate the applicability of these approaches in the context of the Portuguese business environment recognizing the differences in social, political and cultural factors.

As regards this objective, I feel the course was quite successful, though the original course plan was modified considerably throughout the term due to several factors.

My original course reading list was quite extensive, consisting of a general management textbook (Hampton, Summer and Webber, Organizational Behavior and the Practice of Management), a readings packet of about 15 articles, and three smaller, secondary texts: Abrahamsson, Bureaucracy or Participation, Galbraith, Designing Complex Organizations, and Schoderbek, et. al. Management Systems.

A factor I had not considered was that these students' reading speed in English was much slower than in the U.S. and that this was way too much material for them to cover. This problem was however remedied automatically by the fact that the last three secondary texts did not arrive.

Another factor was that the social psychology course given last semester had treated many of the behavioral aspects of management covered in the text for this course (e.g. individual motivation, power, group decision making, etc.)

This allowed me to emphasize some of the more systems and decision sciences oriented perspectives of management and make comparisons between the behaviorist and management science perspectives.

One other factor was that as the computer lab was installed, I somehow needed to give the students instruction in how to use it - i.e. taking time either from the statistics course or the management course. At that time in statistics we were in the midst of studying probability distributions, and a break to discuss computers would have

meant a loss of continuity. On the other hand, in management, we were finishing a discussion of information systems (including office automation and decision support systems), and the treatment of computers here seemed more logical. Fortunately, most students already had some programming experience and this went fairly quickly : roughly, 2 1/2 classes were used to introduce elementary programming in BASIC, 1 class for text editing and 1/2 class for using library programs.

On the other hand, this amounts to 4 classes = 2 weeks lost to the management course. The use of the computer laboratory should, I suggest, be taught at the beginning of the year as a separate short course.

## STUDENTS

The students in this MBA group are undoubtedly very bright and easily able to comprehend theoretical material.

What is rather surprising, however, is their apparent motivation. This business school, as I understand it, is a very high investment for Portugal - carrying with it a high level of expectations, e.g. raising the level of management expertise in the country, aiding the anticipated entry into the Common Market, etc. The students themselves are thus probably among the most advantaged in the country.

Yet, I have the impression (which may be wrong) that few of them realize their role in these grand expectations. Many, indeed, seem merely to be continuing their university studies here as opposed to some other alternative, with no definite goals of entering management or government administration.

I suspect this is a result of the selection procedure which seems based mainly on GMAT scores. I suggest that some other criteria be included as well, such as work experience and/or a written essay about career goals such as is used on the admissions form at Harvard.

The current design of the MBA program is two semesters of required courses followed by one of electives. This is one semester less than the usual standard in the U.S. and elsewhere.

Another limiting factor is that many of the students are continuing in their jobs while they are in the program. Thus, while they are an intelligent group, they are often ill-prepared for class and tend to study on a 'crash' basis for exams and required projects (even more so than in the U.S.!). Further, because of student scheduling problems, group work is more limited.

Thus, with these factors considered, the educational exposure of these MBA's is less than 75% of a comparable U.S. program.

The limitation to three semesters and allowing students to continue in their jobs were established in consideration of the students economic constraints here in Portugal. Given that the program is oriented to Portuguese students for work in Portugal, Portugal is at liberty to establish its own standards.

However, Carlos Barral has recently begun to consider a broader goal of creating a 'Lisbon School of Business' which would accept foreign students which would afterward return to their home countries. For this goal, an accreditation would probably be needed (e.g. by the American Association of Collegiate Schools of Business), and I doubt whether the three term program would be recognized for an MBA. (For comparison, consider that the MBA program in Madrid, sponsored by Harvard, goes for 21 months.)

This suggests that an MBA program best suited for Portugal (e.g. 3 terms) vs an international business school may be conflicting goals to a certain extent.

Another problem I foresee is the lack of 'continuity' of the school faculty. At present, the only permanent professional level person in the school is Carlos Barral. Essentially, the rest of the school faculty changes every four months. This presents a serious problem for the development of the schools curriculum and academic policy and reputation.

This problem would eventually be remedied by the development of Portuguese faculty through foreign recruitment and sending Portuguese students abroad for training.

However, I would like to point out that the school at present lacks a continuing academic emphasis.

Carlos Barral is an excellent organizer, entrepreneur and administrator. Without doubt, the school could never have been assembled and organized in such a short time without his skill and knowledge, especially considering the complex bureaucratic and political factors that are involved.

He is however inexperienced in academic matters - e.g. in curriculum design, faculty relations, library development, promoting research, etc. In the current circumstances, these qualities are less important than the ones he has, though they are important.

In addition, he is heavily overloaded from a work standpoint.

My suggestion, if possible, is to create a secondary position - e.g. like an 'associate dean', filled by someone with an academic background, whose responsibility would focus on the internal operations of the school and its academic continuity.

Carlos Barral's responsibilities would continue to be more externally oriented - i.e. relations with the business community, with the university administration and with the coordinators at Wharton.

date: 7 April 1981

to: Prof. Carlos Barral

from: Prof. Ronald M. Lee

re: Micro computer equipment.

The attached report describes my analysis and recommendations for the micro-computer and related equipment purchase decision in detail. This report is organized around the three classes of applications we discussed, namely:

- a.) student use
- b.) secretarial word processing
- c.) administrative applications.

However, while the report implicitly considers the budgetary constraints we have discussed, I thought it best not to specify in the recommendations.

In summary, the relationship between these purchase recommendations and the available funding sources is as follows:

A. Grant: Banco de Fomento Nacional = 1 200c. Covers package purchase from Sorubal

- 3 x Apple II micro computers
- 1 x Qume letter quality printer.

~~B.~~ Residual funding to cover

-	1	Heathkit WH-88 micro computer	330c.
-	2 x	Heathkit WH-14 matrix printers-each 68.5c.	137c.
-	1 x	Heathkit WH-19 terminal	77.6c.
		subtotal (from Abreu)	<u>544.6</u>
-	1 x	Ohio Scientific C2-OEM micro-computer	262c.
		Total	<u>806.6</u>

I. Identification of Vendors.

Vendors were identified through advertisement of 'micro computer' systems in the Lisbon yellow pages and in the 'Informatica' supplement of 'O Jornal'. Also, two companies (A.P. Agostinho, and SYSCOM) who had not begun to advertise in these media were identified by personal contacts.

In total, the local vendors interviewed were as follows:

- 1) Abreu Junior & Ca., Lda.  
 address: Rua Rodrigues Sampaio, 112-A (L2)  
 Tel. 556464  
 representing: Heathkit  
 contacts: Sr. Vasco Chrystêllo  
 Eng. António Sarmento
- 2) António Pacheco Agostinho, Lda.  
 address: Rua Rodrigues Sampaio, 15, 2º  
 Tel. 578093  
 representing: Ohio Scientific, PERTEC  
 contact: Eng. Miguel Villas
- 3) CIL - Centro de Informática, Lda.  
 address: Av. Almirante Reis, 260, 3º Esq.  
 Tel. 880644/802944  
 representing: LOMAC (Logical Machine Corp.), CADDO Systems.  
 contacts: Eng. José Garrido  
 Eng. Francisco Branco
- 4) CMC (Portugal)  
 address: Rua Sanches Coelho, 2 (L4)  
 Tel. 777072  
 representing: CMC  
 contact: (?)
- 5) COMPTA  
 address: Av. Fontes Pereira de Melo, 14, 11º  
 Tel. 41111/5  
 representing: CODEX (Motorola)  
 also sell computer time on large UNIVAC,  
 NCR machines.

contact: Sr. Arlindo de Carvalho  
Dr. João Calição Grosso

- 6) DATINFOR - Informática, Serviços e Estudos, Lda.  
address: R. Mouzinho da Silveira, 7 R/C  
Tel. 530933/4, 561792  
representing: WANG  
contact: Sr. José Maria Reis (Sócio gerente).
  
- 7) DITRAM - Componentes e Electrónica, Lda.  
address: Av. Miguel Bombarda, 133, 19D  
Tel. 545313  
representing: TRS (Tandy Corp.)  
contacts: Sr. José Campos  
Eng. Rodrigues de Oliveira
  
- 8) RIMA - Racionalização e Mecanização Administrativa, Lda.  
address: Av. Dr. Mário Moutinho, Lt. 1733, 49 (L3)  
Tel. 610871, 610899, 611297  
representing: NIXDORF Computer  
contact: Eng. Nuno Rebelo
  
- 9) SORUBAL, S.A.R.L.  
address: R. Gen. Pimenta de Castro, 15, 89  
Tel. 896555  
representing: APPLE Computer  
contact: Eng. R.N. Baleiras
  
- 10) SYSCOM - Sistema e Equipamento, Lda.  
address: R. Carlos Mardal, 65, 29  
Tel. (?)  
representing: DEC, Datapoint, OKI  
contact: Sr. Manuel Reis

II) First Elimination

Several vendors were eliminated from further consideration (for our purposes) due to certain factors that were unacceptable given our problem situation. Those eliminated and the rationale are as follows:

- 1) CIL - a. LOMAC - these machines are basically mini-sized, with prices starting at 1250c. for a single terminal machine. They are oriented towards data processing and use a vendor developed language ('LOGICAL'). The machines are thus not only out of our price range, but also do not support general purpose languages (e.g. BASIC, FORTRAN, etc.), a necessary requirement for an educational institution.  
  
b. CADO - The CADO C.A.T. (Computer Aided Tutor) is a micro-processor unit combined with dual 8" (double side, double density) diskettes. It is oriented towards text processing and small scale data processing and seems to offer an impressive range of software. Programming is in BASIC (CP/M is not supported). Price is high, 800c. per unit, which includes CRT, CPU and disk drives. The eliminating factor here, however, is that CIL will not have these ready to market until Fall, 1981.
  
- 2) CMC - The CMC machines were eliminated for similar reasons as LOMAC. The smallest machine is 64K, 4 disk drives and 2 terminals, selling for 1500c. Further, only a narrow range of programming languages is supported.  
  
TAL - a vendor language similar to RPG, and COBOL. Text processing and scientific calculations would be difficult.

bureau, selling time on their UNIVAC and NCR machines. (Dial in phone access, however, won't be available until next year.) They are currently in the negotiating stage for representing Motorola's CODEX line, and won't begin marketing for several months. Thus, while the CODEX is a candidate (a 32K unit, plus CRT and 2 512K diskettes costs 600c), the company is eliminated for our present purposes.

- 4) DATINFOR - The company markets two models of WANG - the MVP and the smaller LVP. While numerous MVP's have been sold and installed here in Portugal, DATINFOR is just starting import negotiations for the LVP's, which will take another several months before they are ready.

Both models are oriented towards multi-terminals sharing a single micro processor, diskette drives and a hard disk. A three user MVP system would cost about 2505 c. while a 6 user system is about 4539 c.

The smaller LVP system (not available) would cost 686 c. for a 64K single user system with diskettes and hard disk; additional terminals can be added (upto 3 more), for a cost of 168 c. each. These must be WANG terminals. The language is BASIC, and text processing is supported, though CP/M is not.

These prices do not include the 15% I.T. tax. The company is eliminated based on the uncertainty of delivery and high price.

- 5) RIMA - (NIXDORF) - These are basically mini computer systems oriented towards data processing. The systems support vendor languages plus COBOL but not BASIC or CP/M, etc. Text processing also not supported. Up to 16 users for the smaller system, prices start at 3000 c. Eliminated due to cost and inappropriateness for our applications.

6) SYSCOM - This company is just getting started in a sort of branch office role to a larger company called 'Micromatic', located in Braga. Judging from the literature, Micromatic seems to represent numerous companies notably DEC, OKI, SAT - but the local subsidiary seems as yet unorganized. They do not have demonstration machines, and their sales people are as yet unfamiliar with the lines of products carried by the parent, let alone prices and current stocks. The sort of system that Micromatic seems able to offer would again be of large-micro/small-mini scale with a time shared CPU; memory of 64K - 128K, shared hard disk, etc., though the information I've received so far is rather vague and confused. I think the distance to Braga is too great to deal with directly and the local company, SYSCOM, has not yet given me confidence. This alternative, is therefore eliminated, at least for the time being.

### III. Comparison of Remaining Candidates

After this elimination four vendors remain:

Abreu Junior - Heathkit

Agostinho - Ohio Scientific, PERTEC

Ditram - TRS

Sorubal - Apple.

Each of these companies and their product lines has various off-setting advantages and disadvantages. For this reason, and because certain system components are inter-changeable between manufacturers, it is more useful to make cross-company comparisons by product category.

#### Overall comparison of companies:

The size and expertise of the staff, and the overall 'personality' and the financial stability are important factors in choosing a vendor.

Vendor	<u># emp's</u>	<u># eng's</u>	<u>company age</u>	<u>finc'l stability</u>	<u>'personality'</u>
Abreu	5	1/2**	2?	OK	OK
Agost.*	6	4	1	good	good
Ditram	7-8	1	2	OK	OK
Sorubal	3-4	1	3?	OK	good

\* - For Agostinho, selling computer equipment is only one department of a larger enterprise of about 40 employees.

\*\* - The consulting engineer for Abreu, Eng. Antonio Sarmiento, is also Associate at the Dept. of Informatica.

'Small size' Micro Systems

The micro-systems sold seem to divide into two major categories - 'small' and 'medium'. The small systems range from 16K - 48K memory and use cassette recorders or 5" diskettes for storage. CRT screens are upper case only. The principal contenders here are the Apple II (Sorubal), the TRS-I, Model 2 (Ditram) and the Challenger 4P (Agostinho), and the Heathkit WH-88 with 5" disk drives.

	Memory	Disk	Screen	Level of software	Support CPM	Serve as terminal	Cost/unit
Apple II	48K	2x 5"	UC only	very good**	yes	yes	320.760
TRS-I Mod.2	48K	2x 5"	UC only	good	yes	yes	355.000
Challenger 4P	48K	2x 5"	UC only	(BASIC only)	no	no	230.000*
Heathkit WH-88	48K	2x 5"	UC/ LC	very good	yes	yes	330.000

(\*\* includes VISICALC)

(\* assume monitor at 30c.)

Medium size micro systems - Systems in this category differ mainly from the 'small' micros in that they have CRT screens of standard size (80 x 24) and 8" disk drives. Disks may be single or dual sided, and single or double density. All 4 firms offer a machine in this category, but Apples (Model III) is not yet available and is thus not compared. The others are as follows:

	memory	2x disks 8"		CP/M	expand hard disk.	Price
		sides	dens.			
TRS - II (Ditram)	64K	?	?	?	?	455c.
Heathkit WH-88 (Abreu)	48K	2	2	yes	yes (569c/10mb)	592c.*
Ohio Scientific C3-OEM (Agostinho)	48K	1	1	yes	yes (776c/29mb)	455c.**
Ohio Scientific C2-OEM (Agostinho)	48K	1	1	No	No	342**

\* - unit price at 4 units = 547.500

\*\* - includes 80c. est. cost of terminal.

Comparisons of terminals

Separate terminals were sold by both Abreu (Heathkit), and Agostinho (Hazetline). There are both 'smart' terminals, differing mainly in price. For comparison, the popular Lear-Siegler (sold by Syscom) is included.

	smart?	chars x lines	price	current stock
Lear-Siegler (Syscom)	no	80x24 UC/LC	66.000	?
Heathkit H-19 (Abreu)	yes	80x24 UC/LC	77.625	more than 4
Hazetline (Agostinho)	yes	80x24 UC/LC	130.000	1

Comparison of matrix printers

	c/line	speed	stock :	price
Malibu (Sorubal)	132	90 ?	1	267.170
Silentype (Sorubal)	80	55 ?	2	68.770
EPSON (Agostinho)	80	55 ?	-0-	70.000
WH-14 * (Abreu)	80	55 ?	several	68.425

Comparison of letter quality terminals

	print type	quality	price	
QUME (Sorubal)	DAISY	high	330.770	
PERTEC (Agost.)	non- standard	high	250.000	
DIABLO (Abreu)	DAISY	high	258.000	*

#### IV. Recommendation.

The principal factors affecting the hardware selection are:

- a. the features of the equipment as regards our application areas of:
  - student education
  - word processing
  - administrative applications.
- b. cost of equipment
- c. currently available stocks.
- d. the reliability of the vendor

In consideration of these factors, my recommendations are the following:

##### A. Micro-computer machines.

1. For student use: Three (3) Apple II - (Europlus), each 321c. These machines are preferred for their durability, availability of software, ease of use and learnability and reasonable cost.
2. For word processing applications: One (1) Heathkit WH-88, at 330c. This machine has the advantage of upper and lower case characters on the CRT screen (which Apple does not have). It as well supports CP/M. There are therefore a wide range of text editors available for this machine. This machine is somewhat more complicated than the Apple (making it less desirable for classroom use), however it is much more flexible. In addition to word processing, it supports a variety of programming languages (BASIC, Assembler, FORTRAN and COBOL are available immediately; PASCAL, C and others available later), making it suitable for other administrative applications and for use by students in more advanced Information Systems Courses.

3. For administrative applications - One (1) Ohio Scientific C2-OEM, at 340c (machine = 262c, separate terminal, Heath WH-19, = 78c.). This machine provides a larger size diskette (8"), desirable for data oriented applications, plus a file management software package which will facilitate the easy development of administrative applications. In addition, this model is at the small side of the Ohio Scientific product line, allowing for later expansion as applications grow.

## B. Printers.

Two types of printers are needed.

1. A high (letter) quality printer for student and secretarial word processing and for finished copy administrative reports. DAISY wheel printers are preferred for their flexibility of various print fonts for various languages. My preferred choice here is the DIABLO (258c); however Abreu currently has none in stock and the next shipment may take 'a month or two'. Thus the second choice is the QUME (331c.).
2. I also recommend two (2) matrix printers, for printing which need not be of high quality. For this, the Heathkit WH-14 (each 68c.) are preferred, in that they use standard paper (the silentype requires heat sensitive), and there are currently a number in stock.

Note: each of the three classes of applications (hence each of the three recommend types of micro-computers) will need to access each of these two types of printers. As both types of printers use a serial RS-232 interface, the connections are more less standard, involving at most adjustments in machine protocol.