INTERNET AND IT IN THE TMAD REGION
A Methodology to Promote their Use by General Communities

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Abstract: This paper summarises our experience in furthering the use of the Internet and IT by general communities of northeast Portugal. We discuss the problems and constraints that we faced and the approach taken. Some of the resources made available and the most relevant results achieved are described and discussed.

1 INTRODUCTION

In 2004 the Portuguese government approved, through the Operational Programme for the Society of Knowledge (Programa Operacional para a Sociedade do Conhecimento), the funding of the Basic Skills Teaching and Certification project (Formação e Certificação em Competências Básicas – FCB). Its goals included motivating and increasing the general level of awareness of all citizens in the Trás-os-Montes e Alto Douro (TMAD) region, in northeast Portugal, to the potential of Information Technologies (IT) in general, and the computer and the Internet in particular, thus lessening and counteracting the lack of information that existed in the region at the time.

The project has two main objectives (two different actions) intended for the general community: promoting, training and raising awareness towards the use of IT, and the Internet in particular; and award a Certificate in Basic Skills in Information Technologies to individuals.

The need to train, motivate and involve the community in general towards a correct use of IT tools entails a number of technical and cultural difficulties.

The sensitization and preparation to a new Digital Culture of the TMAD population is the main aim of the project. To this end two different kind of actions were implemented: one that teaches and certificates IT use by individuals (citizens), and another that only certificates IT use by individuals that already know how to use it.

Consequently, there exist two different sets of actions working simultaneously: one of teaching, where the fundamentals of informatics and IT are mastered (Fundamentos Gerais de Informática); and one of certification, where only a final exam is applied to the individuals (Atribuição de Diplomas de Competências Básicas).

The new challenges shaped by the Information and Communication Society demand the preparation of individuals with the right skills to the moment. So we have implemented a programme that tries to teach and certify directors, technicians, public employees, students, un-employees, and the civil society in general, trying to democratise the access to digital information sources and new digital services. We think that this constitutes an important contribution to the information society programme, because without the necessary skills the individuals cannot use the new digital services and reach the digital information. In an abstract way, we want to contribute with the formal validation of basic skills in IT that may add to a complete exercise of citizenship.

It is around these problems and the solutions found to circumvent them that this paper turns.

2 CONSTRAINTS

The physical and human geography of the TMAD region had a major impact on the project, and in a sense determined some of the directions that we followed. The brief outline of the relevant characteristics of the region is necessary to fully understand how the project evolved, and the extent to which it was shaped by the constraints and challenges raised by the characteristics of the target region.

The TMAD region is located in northeast Portugal, and consists mostly of steep hills (slopes reaching 15%) and narrow valleys that flatten out into plateaux above 400m. The Douro river dug deeply into the mountains to form its bed, and the dominant element of the landscape are the vineyards, planted in terraces fashioned from the steep rocky slopes and supported by hundreds of kilometres of drystone wall. The region includes one of the most ancient winemaking regions in the world, and has been recognized by UNESCO as a World Heritage Site.

Despite its unique beauty, the terraces and steep slopes of Alto Douro do not contribute to make the transportation across the region easier. The distances between towns are usually long, and the roads connecting them are twisty and difficult to travel, especially in the winter. It is the vine that drives and sustains the economic activity in the region, which remains deeply rural and sparsely inhabited to the present days. The region covers over 60% of Northern Portugal, yet it contains only 13% of its population. The population density of Northern Portugal is approximately 173 people per square kilometre, whereas that of the TMAD region is close to 38. In fact, the least densely populated areas of the TMAD region average only 10 to 15 people per square kilometre.

The climate is characterised by the scant rainfall, long cold winters and very hot summers ("nine months of winter and three months of hell"). Neither the climate nor the landscape of the TMAD region invite human settlement, but their combined potential for winemaking has attracted people for centuries. At the present time, however, the region is no exception to the generalised population decline and ageing that has been felt in the inland regions of Portugal in recent years. According to the Portuguese Institute of Statistics (http://www.ine.pt), the largest decrease in population in the period between 1991 and 2001 was registered in the TMAD region (about 6%). On the other hand, the fraction of the population aged 65 and over has been steadily increasing, and in the TMAD region it increased by more 20% in the same period, in sharp contrast with the 33% decrease in the age group 0-14. These facts have further aggravated the isolation in many communities.

We were aware of these constraints from the start and soon realised the impossibility of regularly bringing a large group of citizens to the University for training sessions. It would have been impossible to work with the many hundreds of citizens in the TMAD region in this way.

Being deeply rural, relatively isolated, and with an ageing population, the communities of TMAD were largely unaware of the full potential of IT in general, and the computer and the Internet in particular. To promote and encourage an effective use of IT by the community in general, we felt the need to shift the centre of the training effort from the University Campus to the communities themselves.

The method that we employed, discussed in the next section, was shaped by the constraints so far mentioned, and follows in a natural way from them.

3 METHODOLOGY

Setting-up infrastructures is a relatively simple process in comparison with their actual usage, since both the necessary training and the change of habits that lead to routine usage are the result of slow and gradual processes.

We decided to centre the training process in the communities themselves. The methodology implemented is distributed rather than centralised, and consists of a series training and awareness raising sessions.

Bearing in mind some social, economic and geographic factors that we faced in the TMAD region and the goals we wanted to achieve, we have tried a methodology that would allow every citizen to access the formation and certification sessions. Consequently, we have contacted the Town Halls and Board of Villages that have been our partners during the Trás-os-Montes Digital project (please visit http://www.espigueiro.pt for details), as well as some priests that have announced these sessions by the end of the mass, charitable institutions, fire-brigade volunteers, recreation and social associations, medical care centre, prisons (jails), teachers and schools from the first-cycle of teaching, etc.. As it can be seen, we have tried to contact as many as possible different types of institutions, in order to reach different groups of citizens.

Although our strategy was also shaped by the human and physical geography of the region, as explained in the previous section, it has a number of other advantages that we now discuss.

One of the advantages is that it allows working with the people in their "natural habitat", i.e., in the places they used to know.

The possibility of increasing or decreasing the frequency of the training sessions to meet the needs of each community or to adjust the workload to the available human resources is another advantage of the approach. Because the communities have markedly distinct backgrounds on the use of IT, there was a pressing need to adjust the schedule of the training and awareness raising sessions to the demands, as these varied from one community to the other.

Because the communities are often located in remote and sparsely inhabited areas, as it follows from the human and physical geography of the region and the population drainage felt in the inland areas of Portugal in the past years, the training and awareness raising sessions allow for some outside contact, thus breaking the daily routine and isolation. A centralised solution, involving training at the University campus, would not make that possible.

3.1 Training and awareness raising sessions

The main goal of the training and awareness raising sessions is to make the ordinary individual aware of the potential of the computer and the Internet as a source of information and knowledge and as a means of communication. In so doing we are contributing to the development of an information society in the TMAD area. Therefore, one of the noblest objectives of any higher education institution was accomplished – that of making knowledge accessible to the community at large.

The "learning-by-doing" approach was present throughout the whole process, and all sessions were of a practical nature. According to Georg Kerchensteiner, "(...) theory comes naturally out of practice, or rather, both are involved in a process of continuous reciprocity and exchange (Savioz, 1956, p. 268)".

The training and awareness raising sessions were divided into groups. The type of language, material, strategies, and so on, employed for each group was, therefore, adapted to meet its specific needs. These sessions were supported by Netmobiles (Netmóveis). A Netmobile consists mainly of two trainers, one technician and a van, adequately identified and equipped with twelve laptops, a printer, a digital camera, a Router, a Hub, a multimedia projector, a screen projector and a video-conference system among other equipment. Further details can be found in (Reis et al., 2002a, p. 1494).

One of our aims, as already been mentioned, was to promote basic skills training and awareness raising in informatics, in order to set up some practice using computers to the general citizens. These sessions tended to be 12 hours practical sessions, during the working hours or not, and were free of charge. The contents usually introduced were Windows, Word and Internet (Internet Explorer and Outlook Express). By the end of the sessions a final exam was applied in order to certify (or not) the citizens in their Certificate in Basic Skills in Information Technologies (CBIT).

3.2 Certification sessions

At this stage the emphasis was placed on the training and awareness raising of the community in general towards the possibility of obtaining a CBIT (www.diploma.umic.pcm.gov.pt). This certificate is part of the national policy towards the increment of widespread access to IT. The certificate represents an official recognition of the individual's acquisition of skills in word processing, Internet browsing and the use of e-mail.

These certification sessions have a maximum duration of one hour, during the working hours or not. These sessions are intended to certify (or not) the citizens in their CBIT. Any citizen may apply to this exam. The citizens that do not pass this exam can apply to another exam.

During this exam the citizens are asked to answer correctly all the following questions: create a new folder in the desktop and rename it; tape, save and print some given text; browse the internet, search and print some specific contents; electronic mail – email (print, read and send messages with and without attaches).

This exam can only be applied by government certified entities.

3.3 Other type of sessions

Also using the Netmobiles, the research team participated in several events organised by the Town Councils, such as Book Fairs, Home-Grown Produce Fairs and Arts and Craft events among others. This enabled further promotion of the computer and the Internet and their use amongst the community in general. It should be stressed that the presence of the

Netmobiles and their teams in such cultural events was intended to raise awareness and to familiarise the communities with the computer and the Internet. The response was very noticeable, with active participation of people from all ages and backgrounds in both the events and the sessions. The aim was to reach as many people and entities as possible.

In cooperation with the University of Trás-os-Montes and Alto Douro university and the project Utilização Educativa da Internet no Distrito de Vila Real (Educative use of the Internet in the Vila Real district) we have organized the Cibersemana (cyber-week). This activity had a duration of one week, as the name suggests, in the morning or afternoon, and was aimed at children raging from 6 to 18 years old. The children were organized in groups of 10, according to the following ranges: 6 to 10 years old; 11 to 14 years old; 15 to 18 years old. They were invited to the University Campus, where they participated in a set of activities, not exclusively IT ones, but also guided tours to the Geology Museum, Veterinary Hospital, and University Gardens. Other activities also include the Docelândia (a kind of pastry making), Transformex (where some materials were transformed), painting, drawing, and some other basic experiments.

4 RESOURCES

There are some resources developed during the execution of other projects, namely SCETAD–AEP project in 2000 (Santos and Reis, 2001), Trás-os-Montes Digital–AE project in 2001-2003 (Reis et al., 2002a), and Utilização Educativa da Internet–UEI in 2003-2005 (Vieira et al., 2005). These resources were used during the training and awareness raising sessions, especially the ones involving teachers and students, but there is also a resource especially devoted to the general community, namely the site http://www.espigueiro.pt/fcb.

In these resources it is included a site intended to make web browsing easier for teachers in the TMAD, named "Espiguinha", and can be found at http://www.espigueiro.pt/espiguinha. The site consists basically of a set of links to useful sites and/or services of interest to teachers and pupils, tutors and the whole educational community as potential users. This site was used by teachers and pupils as a starting point to the web. The site was accessed more than 673 500 times since its creation in September 2000. This figure is highly significant when compared with the total number of teachers and pupils in the TMAD area — 29 200). The site contains a series of links organised according to topics/areas of interest, including "Teacher's Support", "Resource Centre", "Christmas at Espiguinha", "Carnival at Espiguinha", "Father's Day", "Easter at Espiguinha" and "Mother's Day". In creating the site/link "Teachers' Support", for example, the aim was to compile and gather a series of links covering the three major study areas of the first cycle (primary school): Portuguese Language, Mathematics and Social Studies.

The web site "The Barn of Espiguinha" (Celeiro do Espiguinha) which can be found at http://www.espigueiro.pt/celeirodoespiguinha represents an attempt to develop knowledge and IT skills, and has been crucial for support teachers, pupils and parents throughout the educational process.

Barns were very important in the TMAD region in bygone years. They were used mainly to store cereals, which were a major part of the wealth of the region. The "Barn of Espiguinha" stores information rather than cereals, and offers a number of activities useful to teachers and pupils alike.

The goal was to contribute with content which would enable pupils to learn by playing. The entertainment is designed to be educational, so that the pupil might develop skills either with the help of the teacher in the classroom or with the parents or tutors at home or anywhere else.

Time constraints to cover the whole curriculum were one of the most frequent reasons advanced by teachers for not using the computer and the Internet. The site meets the requirements of the school curriculum set by the Ministry of Education, and renders the task of the teacher easier. The site offers several activities and interactive exercises that cover the various study areas in each of the four years of primary school teaching. It has become extremely useful to the teachers, who have since contributed to its updating (Resource Centre). The content contributed by the teachers includes a set of worksheets for the pupils.

This site is structured according to a series of topics of interest to the whole school community, organised in "pages". There are pages directed at the teachers, and pages aimed at the pupils, which renders the navigation easier for both. The contents, the approach (pedagogic component) and the language meets the needs of the readership, either teacher or pupil. The pages intended for teachers and those targeted at the pupils may share content, but that content is likely to be described by distinct

expressions, such as "exercises" or "games". Whereas the word "exercises" draws the teachers' attention, the word "games" appeals to pupils.

The Barn also allows for the creation of links of interest for the primary schools—like those in "Espiguinha". To encourage the exchange of experiences, ideas, opinions, etc., among the virtual community, an opinion forum and the site "e-@migo" (is-@-friend) was also developed.

Bearing in mind the targeted audience, i.e., children aged between six and nine years old, four characters were created. These characters, which appear throughout the site, represent the children's imaginary world. Empathy between children and the characters is consequently established. The fact that the characters have different interests, personalities and nationalities attempts at making children aware that being different can actually constitute a positive and enriching experience.

Given the teachers' contribution and feedback as well as the number of accesses, the site "The Barn of Espiguinha" can certainly be regarded as highly accepted by the school community. From November 2003 the site has been accessed more than 96 600 times, and the rate of access has been increasing steadily. The exceptions are the months of July, August and September during which the number of accesses falls sharply due to the summer holidays.

Aiming at support and elucidate the general community of TMAD about the Basic Skills Teaching and Certification project we have developed the site http://www.espigueiro.pt/fcb. So, this site contains introductions about the projects' objectives, certification and training and awareness raising sessions in IT, the contents to be learned during these sessions, the final exam model, subscription model, contacts, FAQs, legislation, useful links, etc.. These links are grouped according to thematic areas.

Also, the handbook "The Internet ABC" (B-A-B@ da Internet) was written (Reis and Santos, 2002b) to consolidate the topics dealt with in the training and awareness raising sessions. It presents the topics in a simple and clear way so that it may serve as a support tool for teachers, parents and tutors in their first attempts at using the Internet.

The Internet ABC is divided into three chapters: The World Wide Web, Electronic Mail and FrontPage Express. The programs discussed in the handbook can be downloaded free of charge.

The first chapter defines the Internet, its services and some of the advantages of using it as an educational resource. Web browsing with Internet Explorer 5.0 is also explained with the help of pictures depicting various functions of the program. The chapter also includes examples, a set of exercises and a list of useful addresses.

The second chapter deals with e-mail. It explains it clearly and concisely and teaches how to use it through Outlook Express 5. The topics are illustrated with pictures depicting the functions of the program. The chapter also contains examples and exercises, including the use of e-mail with Megamail services.

The third chapter focuses on the use of FrontPage Express and the construction of web pages. It makes use of pictorial representations, illustrating the various commands, menus and steps that are necessary to create a web page. The chapter also includes a section on WS_FTP.

5 SOME RESULTS

In order to facilitate the interpretation of the data that follows, table 1 presents a comparative analysis of the educational systems in two different countries: Portugal and United Kingdom. A systematic representation of how the educational system is organised in Portugal can be found in http://www.eurydice.org (EURYDICE, 2003).

5.1 Training and awareness raising sessions

A vast number of sessions were conducted: 359 training and awareness raising, reaching 4172 citizens from TMAD region. From these 4172 citizens, ranging from 5 to 92 years old, 1133 are less than 15 years old, 712 are between 35 and 44 years old, and 699 are between 25 and 34 years old as can be seen in table 2. In what concerns to gender, 2350 were females and 1822 males.

From the grand total of 4172, 3464 have been succeed in the CBIT, 292 already awarded the Certificate, 14 are still waiting for identification documents, 348 were not present in the final exam or quit and 46 have not been approved in the final exam. Note that all these 46 citizens have more that 65 years old, and that some cannot even write or read.

In what concerns to the scholar studies (grade) we have noticed that 1176 citizens have the 3rd stage of the first cycle, 941 the 2nd stage of the first cycle and 849 only the 1st stage of the first cycle (table 3). As for professional qualifications we may see, table 4, that 1673 were students, 734 unqualified workers (that do not have a skilled profession), 227

Table 1: Portuguese (PT) and United Kingdom (UK) teaching systems (EURYDICE, 2003).

Years (PT and UK) →		1	2	3	4	5	6	7	8	9	10	11	12
Portugal	Pre-scholar teaching	Basic teaching									Secondary teaching		Superior teaching
		1st cycle				2nd cycle		3rd cycle					
Years old	3 – 5	= 6				= 10		= 12			= 15		= 18

United Kingdom	Pre-primary school	Primary school		Secondary School		Superior teaching
		Stage 1	Stage 2	Stage 3	Stage 4	
Years old	0 – 5	= 6	= 8	= 12	= 15	= 17

house-wife, 221 administrative personal, and 208 unemployed.

Table 2: Groups or ranges of age.

Less than 15	1133	27,2%
15-19	522	12,5%
20-24	278	6,7%
25-34	699	16,8%
35-44	712	17,1%
45-49	330	7,9%
50-54	199	4,8%
55-64	215	5,2%
Older than 64	84	2,0%
TOTAL	4172	100%

Table 3: Scholar studies (grade).

Less than 4 years	63	1,5%
1st Stage (1st Cycle)	849	20,3%
2nd Stage (2nd Cycle)	941	22,6%
3rd Stage (3rd Cycle)	1176	28,2%
Secondary education	745	17,9%
Diploma or BA/BSc	392	9,4%
Master or PhD	6	0,1%
TOTAL	4172	100%

We have reached 33 councils of the grand total of 38 in the TMAD region, reaching 190 institutions.

5.2 Certification sessions

Since January 2004 until September 2006 we have fulfilled 23802 certification exams, and form these 21018 citizens have been succeeded. From the remaining 2532, 252 are still waiting for personal identification (such as identity card) and 2532 had already a certificate or they have failed the final exam or they have desisted during the exam. From the 23802 citizens that have applied to the final exam 13401 have less than 15 years old and 6297 have between 15 and 19 years old (table 5).

In what concerns to the scholar studies (grade) we have noticed that 9311 citizens have the 3rd stage of the first cycle, 6781 the 2nd stage of the first cycle, 1817 only the 1st stage of the first cycle, and 42 less than 4 years of scholar-ship (table 6).

In what concerns to gender, 12233 were females and 11569 males.

As for professional qualifications we may see (table 7) that 20154 were students, 851 unqualified workers and 636 teachers.

Table 4: Professional qualifications.

Administrative people	221	5,3%
Agriculture and Forestry	117	2,8%
Building construction	135	3,2%
Entertainment	7	0,2%
Firemen	16	0,4%
House-wife	227	5,4%
Medical/ health professional	87	2,1%
Middle range professional	14	0,3%
Others	31	0,7%
Preschool teacher	54	1,3%
Protection and safety	141	3,4%
Qualified professional	48	1,2%
Retired	122	2,9%
Services	173	4,1%
Student	1673	40,1%
Teacher	164	3,9%
Unemployed	208	5,0%
Unqualified professional	734	17,6%
TOTAL	4172	100%

We have reached 46 councils, reaching 570 institutions (primary schools, secondary schools, recreation and social associations, medical care centre, prisons (jails), Town-Halls, etc.).

Table 5: Ranges or groups of ages.

Less than 15	13401	56,3%
15-19	6297	26,5%
20-24	780	3,3%
25-34	1199	5,0%
35-44	1014	4,3%
45-49	486	2,0%
50-54	304	1,3%
55-64	237	1,0%
Older than 64	84	0,4%
TOTAL	23802	100%

Table 6: Scholar studies (grade).

Less than 4 years	42	0,2%
1st Stage (1st Cycle)	1817	7,6%
2nd Stage (2nd Cycle)	6781	28,5%
3rd Stage (3rd Cycle)	9311	39,1%
Secondary education	4738	19,9%
Diploma or BA/BSc	1090	4,6%
Master or PhD	23	0,1%
TOTAL	23802	100%

Table 7: Professional qualifications.

Administrative people	414	1,7%
Agriculture and Forestry	107	0,4%
Building construction	158	0,7%
Entertainment	30	0,1%
Firemen	16	0,1%
House-wife	233	1,0%
Medical/ health professional	94	0,4%
Middle range professional	62	0,3%
Others	53	0,2%
Preschool teacher	91	0,4%
Protection and safety	166	0,7%
Qualified professional	211	0,9%
Retired	114	0,5%
Services	189	0,8%
Student	20154	84,7%
Teacher	636	2,7%
Unemployed	223	0,9%
Unqualified professional	851	3,6%
TOTAL	23802	100%

6 CONCLUSIONS

According to the evidence gathered throughout the last few years the introduction of IT in the communities of the TMAD region has been a success. As far as we can tell, the methodology used proved to be highly adequate in the achievement of our goals. The transfer of the training process from the University Campus to the communities themselves allowed for a very high degree of participation. Our efforts to put theory into practice were rewarded by a quicker rate of acceptance by the community in general.

The social role of the visits was important, and grew with the isolation of the communities being visited. The prompt availability of the trainer and the ability to support the citizens by telephone, mobile phone, fax, e-mail or any other means was also an important aspect.

The methodology discussed may represent a new concept in training and a new training model highly suited to regions sharing the characteristics of the TMAD region.

According to the results obtained during the teaching and certificating sessions we can see that people having less than 19 years old are more motivated to these kind of actions in the informatics field. Also we note that people under 19 years old apply directly to the final exam more frequently than the older ones, which want first the teaching sessions.

Having in mind the number of schools were certification and teaching sessions were organized, approximately 410 schools from the various levels of teaching, we may say that the schools in the TMAD region are motivated to promote this actions close to their teachers, students, and auxiliary people. We think that by doing so they recognize the importance of IT.

The use of the Internet, namely of web services and e-mail, was addressed through various training and awareness raising sessions (supported by Netmobiles) directed at the community in general. Such sessions enabled many individuals in the region to have their first contact with and experience of ITs. This constitutes a sound and valuable contribute in terms of awareness raising, training and development towards IT in the region.

Several factors played a very important role in the achievement of these goals: The training team was always present or could be easily contacted; There was a continuous exchange of experiences; A vast number of individuals and entities participated in the project. As a result, the process appears to have become self-supporting, and there is already some evidence that IT would continue to be used in the schools and communities even if our efforts were discontinued at this point. Nevertheless, as it is well known, education is a complex, lengthy and gradual process, and persistence and more fieldwork may well be required before the educative use of IT

gathers sufficient momentum throughout the entire TMAD region.

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