ALFA Programme
Sub-programme A:
Academic and Institutional Management

FINAL Technical Report

Contract Number:	AML/B7-311/97/0666/II-0465-FA
Project Title:	RexNet-yippee. Remote Experimentation Network – yielding an inter-university peer-to-peer e-service
Coordinating Institution:	Polytechnic Institute of Porto (IPP)
Network's Name:	Remote Experimentation Network (RexNet)
Study Area:	Mechanical, Electrical & Computer engineering and also Social & Economic Sciences in general
Date of Signature:	7th of December 2004
Date of coming into effect of the contract:	1st of January 2005
Contract Duration:	24 months
Addenda (number and object)**:**	Amendment 2 - Add team members to project partners UP and IPP; request permission for one representative from a new project partner (amendment 1) to participate in the project final meeting. Amendment 3 - Add team members to UFRGS; request minor transfers between budget headings
Date of Contract Termination:	31st of December 2006

Period covered by the FINAL Report:

- **from** (Date of coming into effect of the contract)**:** 01/01/2005
- **to** (Date of Contract Termination)**:** 31/12/2006

Coordinator:
Full Name: Gustavo Ribeiro da Costa Alves
Position: Adjunct Professor
Faculty/Department/Service: Polytechnic Institute of Porto / School of Engineering / Department of Electrical Engineering

Date: / Mar. / 2007 Signature:

Legal Representative:
Full name: Maria do Rosário Gambôa Lopes de Carvalho
Position: Vice-President IPP

Date: / Mar. / 2007 Signature and stamp of the Coordinating Institution:

Note: *To be accepted, this report must be* ***signed by the coordinator of the project*** *and* ***signed and stamped by the legal representative of the coordinating institution.***

I. Introduction

In order to present a global appraisal of the project at its end, the Final Technical Report will be a **compilation** of relevant information during the project implementation including the part corresponding to the period covered by previous progress reports.

Furthermore, the Report will present in detail the activities developed during the period not covered by the last progress report. As regards to the form to be given to the present report, we recommend you to refer to the web page of the ALFA Programme (Cf. Guidelines for the Candidate, Annex II and FAQ, question n° 13):

"The Report will be constructed so that it permits a comparison between the objectives, means and results envisaged and those obtained or really applied.

To facilitate that comparison, we strongly recommend the presentation of a table made up of two columns: the first column intended for the objectives, activities and results envisaged in the contract; and the second column intended to indicate the degree of fulfilment of those objectives, activities and results.

Furthermore, it is essential to explain and justify all the cases of not accomplishment of the objectives, activities and results envisaged.

If an objective or result finishes being more successful than what it was envisaged, please inform us in detail about it as it will be of interest for the ALFA Programme and its beneficiaries.

II. Content

The Final Technical Report will have to explain the following aspects:

II.1 Activities accomplished by the Network.

A compilation of the activities developed by the Network and particularly during the period not covered by the last progress report(s).

To describe the activities which have not been explained in a previous report, we strongly recommend the presentation of a table made up of two columns: the first column intended for the objectives, activities and results envisaged; and the second column intended to indicate the degree of fulfilment of those objectives, activities and results. (Cf. Guidelines for the Candidate, Annex II and on the ALFA web page FAQ, question n° 13).

Indicate, for each activity not object of a previous progress report, the following:

- Type of activity (technical meetings, study visits, seminars, workshops, intensive courses, etc.); objectives envisaged; place and date of realisation;

- List of participants at the various activities; type of responsibility of the participants in their institution; nationality of the participants;

- Enclose for each activity, all products generated by the project (minutes of meetings, reports concerning the visits, etc.);

- Indicate if the activities have been developed along with or in parallel with other activities related or not to other ALFA projects;

- Indicate all results reached as regard to the planning and initial schedule;

- Comment the eventual difficulties met as part of the organisation;

- When appropriate, refer also to the modification brought to the initial project and their justification.

II.2 Measures of evaluation and impact of the project.

- Describe the means that allow assessment of the project impact;

- Describe the methodology used for assessing the activities;

- Give examples of good practises, learned lessons and/or success stories that should be spread.

II.3 Visibility and results diffusion

Describe and send enclosed the results achieved according to the initial envisaged objectives.

Besides the Final Report all products that the project has generated must be sent to the European Commission: articles published in the framework of the project, books, CD ROM, and other publications, conclusions of meetings (seminars, workshops, short-term visits) etc.

According to Art. 6 of the General Conditions of the contract, all the results or products of the project must mention the financial support of the European Community (ALFA Programme).

Furthermore, the beneficiary will give in the Final Report a detailed description of: the measures adopted to guarantee the visibility of the Community financing (Cf. EU Visibility Guidelines for External Actions: http://europa.eu.int/comm/europeaid/visibility/pdf/europaid_guidelines_en.pdf).

For the projects foreseeing as results the preparation of a Web page of the project, please inform us of its address.

II.4 Network

- The degree of participation of each member of the network to the development of the project must be commented. (Including the conditions of the cooperation and coordination between the participating institutions);

- Precise the communication system used by the Network's members;

- Suggest eventual possibilities of growth (or modification) of the Network in future projects, as well as its viability.

- Mention if other agreements were reached with associate institutions or institutions external to the Network.

II.5 Other aspects

- Describe problems and successes met;

- Suggestions.

III. Formal aspects

The **Final Technical Report** must be drawn up in the language of the contract and must be accompanied by a Request for Payment (Annex V of the contract).

The **Final Technical Report** must be drawn up in duplicate (one original and one copy), at the latest three months after the ending of the contract. Both copies will include the full content of the Report (including final products).

The **Final Technical Report** should be sent to the address indicated in the contract.

Payment requests, reports and changes in bank account details should be communicated to:
European Commission
EuropeAid – Co-operation Office
To the Attention of the Financial Unit
Office: J-54 6/24
B-1049-Brussels
Belgium
Fax: + 32 2 295 69 77

All technical reports and copies of the documents referred to above, and correspondence of any other nature, should be sent to:

European Commission
EuropeAid – Co-operation Office
Unit B/2
ALFA Programme
Office: J-54 4/29
B-1049-Brussels
Belgium
Fax: + 32 2 299 10 80/47

As reminder: Final Report is made up of:

- **Final Technical Report,**
- **Final Financial Report,**
- **Audit Report, when stipulated in the particular conditions of the contract,**
- **Request for payment and financial closure (Annex V of the contract).**

Do not forget to enclose the products generated by the project: *publications, conclusions of meetings, books, CD ROM, etc as well as the Web page address*.

II. Preamble

This final report describes the goals, activities, and results obtained during the project implementation period of 24 months, including the ones already described in the intermediate report, which covered the first 12 months. It is formatted according to the suggestions contained in the Introduction. It does not include a technical annex as all the project outputs were compiled into a DVD (1st and 2nd versions) that accompanies this report. For a comprehensive listing of all project outcomes please consult this DVD that contains the following navigation options:

- About
- Background
- Partners
- Activities
  - 1st, 2nd, 3rd and 4th consortium meetings plus all bilateral meetings
- Remote labs
  - description, photos and videos of 9 remote labs hosted by consortium members
- Results
  - Publications, theses, projects, partnerships, events, etc.
- Links

II.1 Activities accomplished by the Network.

Objectives envisaged in the contract		**Objectives achieved within the contract period**
Degree of fulfilment *> 100%*	*Main goal*: Share and spread current competences on Remote Experimentation (and on other forms of e-learning) detained by members of the consortium, in order to harmonize the use of this auxiliary resource (as a complement to using local labs) within courses provided by member institutions.	The remote experiments supported by each network member are available to all other members (*share*) since the kick-off-meeting (where common logins and passwords were defined). During the 1st year a number of new remote experiments were developed and again made available to the entire consortium. At the same time, Brazilian institutions associated with the Federal University of Santa Catarina (*Universidade Federal de Santa Catarina*, UFSC), i.e. the project technical coordinator, contributed with another pool of remote experiments while benefiting from the ones hosted by UFSC (*spread*). Also during the reported period, two new institutions joined the consortium (*spread*) as denoted by the

		addendum 1 to the contract. The team size of some consortium members also grew, which enabled the inclusion of some more remote experiments. This was the case with UP (António Cardoso and Teresa Restivo), IPP (Paulo Ferreira and Ricardo Costa), and UFRGS (João Manuel Gomes and Frederico Schaf), as a result of project amendments 2 (September 2006) and 3 (October 2006). The list of all remote experiments made available to the consortium is included in the accompanying DVD (version 2).
Degree of fulfilment *> 100%* *(includes an additional Workshop in LA organized in conjunction with the last consortium meeting, in Santiago, Chile, on the 12th December 2006)*	*Secondary goal (1)*: Organize a workshop on Remote Experimentation (one year in Europe and following year in Latin America);	An International Workshop on Remote Experimentation was held at Florianópolis, Brazil, during the 1st consortium and kick-off meeting (KOM). The event was hosted by the local partner, and several elements from surrounding Universities, namely UNISUL, among others, attended and participated on it. The consortium decided to swap the order, i.e. organize the 1st workshop in Latin America (LA) and not in Europe (EU), to stress the role played by the LA partner acting as the project technical coordinator. This decision was also supported by the fact that the idea to setup the present network originated from early talks, held at Brazil, between two institutions now members of the consortium. The following International Workshop on Remote Experimentation was held in Porto, Portugal, from the 4th till the 8th of June, and it was organized in conjunction with project ALFA-II-0341-A LEAL. It was recorded in video and broadcasted live through the Internet. The list of participants, the powerpoint presentations, the videos and some photos of the event are contained in the RexNet DVD. Given the large interest gathered along this event, the consortium decide to organized a second Workshop in LA, in conjunction with the project final meeting. Again, it was recorded in video and broadcasted live through the Internet. The list of participants, the powerpoint presentations, the videos and some photos of the event are also contained in the RexNet DVD. One of the new project partners (the University of Deusto, Spain) organized an International Meeting on Professional Remote Labs, in Bilbao, Spain from the 16th till the 17th November 2006, with the participation of members form the RexNet project (IPP and the University of Bremen) and from the LEAL project (Carinthia University of Applied Sciences). A book with selected contributions

		has been edited during January / February and is expected to be launched during March / April 2007. The consortium is also organizing a special session on Remote labs, within ICBL 2007 (http://www.icbl-conference.org), again jointly organized by projects ALFA RexNet and LEAL. The event will take place in Florianópolis, Santa Catarina, Brazil, from the 7th till the 9th May, 2007.
Degree of fulfilment *< 100%*	*Secondary goal (2)*: Agree on a common lab script format for describing the conduction of a remote experimentation session (with multilingual support);	All partners agreed to adopt a common Virtual Learning Environment (VLE) as the first action towards this objective. This was achieved to a large extent as Moodle was adopted by most partners as the selected VLE. The common lab script, as now understood by the project partners, must reflect the diversity of remote experiments available inside the consortium and therefore it was not possible to achieve this goal, given the resources allocated to the inclusion of new remote experiments and the additional dissemination activities.
Degree of fulfilment *Not Accomplished (NA).*	*Secondary goal (3)*: Create templates for lab reports, editable on-line and supporting automatic correction by the remote lab server;	This goal occurs from the previous one and was not accomplished.
Degree of fulfilment *> 100%*	*Secondary goal (4)*: Produce a report on Institutional Needs on Remote Experimentation, covering the areas already served by remote labs supported by consortium members;	During the technical discussions held at the KOM, the consortium defined a simple questionnaire to be distributed and answered by all members (see action list included in the annex – points 11, 12 and 13). The findings were grouped in two Excel files that establish all possible connections between existing remote experiments and existing courses belonging to the consortium members. Some of the findings enabled the project coordinator to write down a technical paper and an extended abstract submitted to two international conferences: the 10th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA'05), Catania, Italy, September 2005, and the 11th International Conference on Technology Supported Learning & Training (Online EDUCA Berlin 05), Berlin, Germany, December 2005, respectively. The paper published at ETFA'05, the extended abstract presented at ONLINE Educa Berlin 2005, and more than other 20 papers published in International Journals and Conferences are included in the RexNet DVD and may also be referred as part of the main project goal

		(*share and spread current competences on remote experimentation*). This large number of publications is the result of an extensive contribution form all project partners.
Degree of fulfilment *< 100%*	*Secondary goal (5)*: Establish a broad network of tutors' assistance to remote experimentation sessions, by taking advantage of the time difference between participating countries (7 to 8 hours between Mexico and Germany).	The consortium did not achieve this goal in its initially expected format. The tutor availability is a constraining factor that is being addressed by the development of an intelligent tutoring system, by one of the project partners, i.e. ITESM. The results achieved so far are described in two papers included in the RexNet DVD. The referred system is open to the entire consortium and can be replicated by any project partner.

Task n.		**Activities envisaged in the contract**	**Activities carried out within the contract period**
Planned	**Executed**		
T1 Start: M1Y1 End: M12Y2	Y1 and Y2	Creation and maintenance of a web site for centring all the information regarding the project, namely its objectives, the consortium partners, and the available remote experiments, among other items.	The project website is hosted by UFSC, Brazil, which acts as the project technical co-ordinator (as expressed in the original proposal submitted to the Alfa Programme). A unique domain, totally devoted to project RexNet and its activities, was acquired in late 2004 and donated to UFSC by the project co-ordinator, the Polytechnic Institute of Porto (*Instituto Politécnico do Porto*, IPP). The project website is accessed through that domain, named www.rexlab.net, and included the following links: About; Events; Publications; Remote Experiments; Contacts; and Links. It also contains a restricted access area (all consortium members have a login and a password to enter this area) and a forum for discussing issues related to the project activities. At the page bottom there is a series of links to sites related to the Alfa Office, while the home page also exhibits the Alfa logo and the RexNet project logo. A website dedicated to the one of the International Workshops on Remote Experimentation was developed at IPP, at http://www.isep.ipp.pt/wier06. It includes all the relevant information and an indication on the joint organization of the RexNet and LEAL projects. A new layout for the project website was implemented in mid 2006 and a new development and contribution concept is being now discussed, based on a wiki approach.

T2 Start/End M2Y1 / Start/End M3Y1	Kick-off meeting (KOM). The first general meeting will serve as a starting point for T3 and T4. Among the expected outcomes are also the definition of a table with the first cross-institutional trials, with a clear indication of both the providing and client institutions, and the moment of realization. The definition of the 1st Workshop, namely its contents and program committee, will also be addressed at this meeting.	The KOM ended up being part of the International Workshop on Remote Experimentation, organized by the consortium at Florianópolis, Brazil. Several partners presented their current work on the field and the all consortium had the opportunity to visit the RexLab headed by Dr. João Bosco da Mosta Alves. The copies of all presentations and some photos from the event are included in the RexNet DVD. From the presentations it was clear that all partners detain a reasonable degree of knowledge in the remote experimentation arena, and that collaboration is already addressed in actual and future plans. Already established collaboration schemes are described in more details under Activity T5.
T3 Start: M3Y1 End: M6Y1 / Start: M4Y1 End: M9Y1	Specify and develop a common lab script structure for existing remote experiments (1st iteration before T5, and second iteration before T9). Where possible, the lab script should contain editable fields, which may be filled in on-line. The system will be expected to return the indication of errors and suggestions of improvement, i.e. how the experience should be repeated, preferably with tutor assistance.	All partners agreed to install at their Institutions the VLE named Moodle, due to several reasons, one of the most important being the fact it is a free and open-source platform. This platform provides the common ground for the lab scripts, and some partners do provide already not only contents but also activities: a keyword in Moodle that may refer to a remote experiment. The remaining aspects (i.e. editable fields, system returning the indication of errors and suggestions of improvement) were not considered by the consortium members, as already referred in the previous table.
T4 Start: M8Y1 End: M10Y1 / Start: M8Y1 End: M10Y1	Identify and setup a pool of international (overseas) tutors for assisting on the conduction of remote experiments (the assistance will mainly be provided by videoconference facilities, either integrated in the actual interfaces of the remote labs or as a separate resource).	This activity was divided into two parts: i) how to establish a common communication platform; and ii) the feasibility of the tutors' pool. The first part was addressed through a widely accepted video-conference system, named Flash Comm Server, acquired by the consortium. The 2nd part proved difficult to address due to the limited available time of some consortium partners. This is a crucial aspect already pointed out by the educational community, i.e. the amount of time that teachers have to devote to both synchronous and asynchronous communication tools in parallel with their normal, presential, lecturing duties. Discussion on this aspect is still open.

T5	Start: M8Y1 End: M10Y1	1st round of cross-institutional trials with small target groups in the client institutions. The expected outcome is a full report covering aspects such as: ease of use; bandwidth requirements; quality of the lab scripts; etc. A set of short term visits is included in this task.	This activity was not implement in its full scale. There was only a restricted number of partner-to-partner initiatives, with few students involved. An interesting and important action resulting from this activity was implemented in the form of a new collaboration project among SENAI-RS (a vocational training centre sited at the state of Rio Grande do Sul, Brazil), the Federal University of Rio Grande do Sul (UFRGS), the University of Bremen (UB) and the Technical University of Berlin (TUB), these last three institutions being part of the RexNet consortium. Within this project, an MSc student from UFRGS (Mr. Frederico Schaf) visited the UB and carried out a series of tasks, further continued at his home institution. The visit of a researcher form UFRGS (Juarez Silva) to IPP and UP during the 2nd term, proved quite successful, and largely contributed to the results achieved on his PhD. work. Also worth mentioning was the submission and further acceptance of project proposals to the National Research Funding Agencies of Chile and Mexico, by PUCC and ITESM, respectively, which enabled future actions within this RexNet activity.
	Start: M8Y1 End: M10Y1		
T6	Start: M11Y1 End: M11Y1	International Workshop on Remote Experimentation (IWoRE'05).	Although scheduled for the last quarter within the 1st year of activities, and to take place in Europe, the consortium agreed to advance this event in time and make it coincident with the 1st general meeting, hosted by the project technical co-ordinator, at Latin America. The DVD includes the workshop program and copies of all presentations. A special reference should be made to the involvement of all project partners, not only during the II WIER, but also during the 2nd general consortium meeting, where a significant number of presentations were made. This last event was open to third parties and the consortium had a special concern in publicizing it, not only through the ALFA office website, but also through press releases and both the TUB's and UB's websites. The copies of the presentations made during the 2nd consortium meeting and some photos from the event are included in the RexNet DVD.
	Start: M3Y1 End: M 3Y1		

T7 Start: M12Y1 End: M2Y2	Start: M4Y1 End: *open*	Analysis of institutional needs within the areas covered by remote experiments supported by consortium members. The report should include the identification of disciplines in courses offered by consortium members that could benefit from remote experiments made available within the consortium, and also address the harmonization of such disciplines, regarding the practical side of its programmes.	Besides the findings that emerged from the questionnaires filled out by the project partners, the planned bilateral visits contributed to the results expected from this activity. The presence, at the visited institution, of the person responsible for a remote experiment, located at the visiting institution, enabled the social contact with potential users (both lecturers and students), triggering for the establishment of trials. During the 1st year of activities there was a total of eight bilateral meetings scheduled, four between LA partners and another four between EU partners. All EU bilateral visits were fulfilled, while only one LA bilateral visit was fulfilled (the three others were postponed to the 2nd year). In all bilateral meetings the purpose was to disseminate, within the visited institution, the area of remote experimentation. During the 2nd term all foreseen EU bilateral visits were implemented. As for the LA bilateral meetings there was a total of 6th meeting carried out during the 2nd term, i.e. 3 not implemented during the 1st term plus 3 planned form the 2nd term. Only the bilateral meeting from UFSC to ITESM was not implemented due to problems raised from the new fact of Brazilian citizens being obliged to have a visa for entering Mexico.
T8 Start: M3Y2 End: M4Y2	Start: M4Y1 End: *open*	Second term meeting. Evaluate the work done so far and prepare the second term, namely trials in main stream classes.	Due to the possibilities offered by the fact of IPP being a member of another ALFA project (0341-A) and also the coordinator of yet another ALFA project (0345-A), the consortium decided to organize the International Workshop on Remote Experimentation, planned for the 2nd term, in conjunction with this meeting. The event was laregy publicized as the “The e-learning fortnight” and gathered many particpants form both Europe and latin America, i.e. aproximately 100 participants. The RexNet DVD contains several material on this event, which was broadcasted live through the Internet and also recorded in video.

T9 Start: M4Y2 End: M10Y2 Start: M4Y2 End: M10Y2	2nd round of cross-institutional trials in main stream classes. Expected outcome is a full report with a structure similar to the one originated by T5. A set of short term visits is also included in this task. This task should span over a period of six months to accommodate disciplines belonging to the 1st or 2nd semesters.	As the International Workshop planned for the 2nd term was antecipated to June it was not possible to implement this activity, in its original format. Most of the bilateral meetings were done but no cross institutional trials. The consortium, however, started a formal discussion on the possibilities of establishing a joint International Master degree on Remote Engineering. This discussion was concluded during the final consortium meeting that took place in Temuco, Chile, during the 2nd week of December.
T10 Start: M11Y2 End: M12Y2 Start: M11Y2 End: M12Y2	International Workshop on Remote Experimentation (IWoRE'06).	Although antecipated to take place in conjunction with the consortium meeting held in Porto, during the 1st week of June, the consortium decided to organize one open-day during the final consortium meeting. Therefore the consortium organized an International Workshop on Remote Experimentation, with invited contributions and open to the general public,which run at PUCC, on the 12th December, in Santiago, Chile. Again the event was broadcasted live through the Internet and recorded in video.

Results envisaged in the contract	Results obtained during the contract period
The website and the electronic newsletter (T1) This result comprehends a set of web pages with information on the project, its goals and activities, the consortium, and several links to sites related to remote experimentation. It will also contain links to the RexNet consortium members, namely to the existing remote labs and to the resources available to all.	 The figure represents the entry page of the RexNet website. The URL is www.rexlab.net. Other associated URLs (belonging to Institutions that are part of the consortium or associated with it) are: www.rexlab.ufsc.br www.rexlab.unisul.br

The Remote Experimentation Network (T2, T3, T4, and T8) This is the most tangible result of the proposed project: a network of remote labs providing experiences on different engineering fields, with lab scripts and templates for lab reports (editable on-line with automatic correction) available in several languages (English, Germany, Portuguese, and Spanish) and an international pool of tutors able to assist on the execution of those experiments. Additionally, it will provide a verification & validation scenario for two tools under development: an Intelligent Tutoring System (ITESM) and a Booking System (University of Dundee).	Several remote experiments are available to consortium members. Specific results of collaboration / cooperation between and among partners are: a) the joint project on e-learning (with remote experiments on control, automations and robotics) with SENAI-RS, UFRGS, both from Brazil, plus TUB and UB, both from Germany; b) the Intelligent Tutoring System, developed by ITESM and used by UFRGS; c) the Virtual and robotics lab, hosted by ITESM and currently being used by UCT; d) the Booking System developed by UP, for the Moodle system, and currently being used by UB, UFRGS, IPP, and UCT; e) the network enlargement with two new Institution members, as expressed in the 1st project amendment, namely UPC and the University of Deusto, both from Spain; f) and, finally, the participation of several RexNet partners in a project funded by the Chilean Agency for Research Funding, which will be carried out by PUCC. Also worth mentioning is the academic collaboration between some partners, for instance the participation of the unit interlocutor from UFSC in the MSc. Examination board of Mr. Frederico Schaf, from UFRGS, who worked on several aspects related to remote experimentation, in particular during his stay in Bremen, in another project partner, i.e. the University of Bremen. The participation of the project coordinator (Gustavo Alves, from IPP) in the PhD Examination board of Mr. Juarez Bento da Silva, from UNISUL, is another example of EU-LA academic cooperation within the RexNet project.
The Reports on trials results and institutional needs (T5, T7, and T9) These documents will contain the findings from the two trial rounds (first with small target groups and then with large classes) and the analysis of institutional needs on remote experimentation (from the consortium members). The decision on whether to create three independent reports or a single report with three main parts (as the contents are related) will be taken by the consortium on its first meeting.	The consortium did not produce such a report. This result was not achieved, as others, not foreseen in the original project proposal, required the resources (time, in particular) that should have been allocated to the activities leading to it.

The International Workshops on Remote Experimentation (IWoRE) (T6 and T10). These events provided an opportunity to: a) disseminate the area of Remote Experimentation; b) submit, publish, and present articles on current best practices and associated state-of-art technology; and c) arrange contacts for new partnerships.	The presentations made during the International Workshop on Remote Experimentation held at Floripa, Brazil and the Seminar on Remote Experimentation, held in Berlin and Bremen, Germany, together with the papers published and presented at ETFA'05 and Online Educa Berlin 2005 (OEB'05) demonstrate the level of dissemination achieved by the consortium, during the 1st year of activities. In addition, some partners have also submitted and / or published papers describing their own remote experiments and supporting mechanisms / methodologies in relevant international conferences or journals (e.g. ITESM published a paper on its robotics course and tutor system at the 35th ASEE/IEEE Frontiers in Education Conference). The consortium organized in the 2nd year of activities, an International Workshop on Remote Experimentation, held in Porto, Portugal, with the presence of the two new partners and the participation of institutions from other ALFA projects, namely LEAL (II-0341-A) and FADO (II-0345-A). The Workshop held in Santiago, Chile, on the 12th December, in parallel with the last consortium meeting also included invited presentations and was also open to the general public. Both events were recorded in video and broadcasted live through the Internet. An important aspect was the presence of persons belonging to the host Institution Administration, which was regarded as a crucial step towards the recognition of remote experimentation as an university e-service, part of the general e-learning strategy of any Institution of Higher Education.

Some bilateral academic agreements were also signed during the project period of implementation, e.g. between IPP and UNISUL, among others.

II.2 Measures of evaluation and impact of the project.

- Means that allow assessment of the project impact.
- Methodology used for assessing the activities.
- Good practices / lessons / success stories.

The growing interest around remote experiment, denoted by the number of specialized events (e.g. REV, http://www.online-lab.net/rev/) and publications (e.g. i-JOE, http://www.i-joe.org/), is a factor that allows measuring the project impact, in particular if one considers the number and relevance of the contributions made by project partners to those events and publications. The level of participation in the International Workshops on Remote Experimentation, especially on the one organized at Porto, as part of the "e-learning fortnight", is another factor that allows assessing the project impact.

II.3 Visibility and results diffusion.

Again the results described in the RexNet DVD (divided in training/theses, projects, papers, and seminars) allow measuring the visibility level achieved by the RexNet project. Explicit reference to the support of the ALFA co-operation program is included in most of the papers, while the Workshops were advertised as events supported by the ALFA office, through the corresponding project identification numbers. This is also clearly visible through the videos that were recorded during the two last Workshops, the many photos taken during all events, the press releases, and the posters advertising them. Again, it is possible to verify this item through the contents available in the RexNet DVD. The contents available through the network website (www.rexlab.net) will also reflect this reality, in the near future, as the partner responsible for its management is still working on adapting the DVD contents for HTML access. It should be mentioned that the DVD is available to the general public and that two versions of it were produced: one in time for the last consortium meeting (that did not include the materials obtained during its realization) and one edited afterwards (that included all those new materials). In total, 100 DVDs of both versions were fabricated.

II.4 Network.

> The degree of participation of each member of the network to the development of the project.
> Communication system used by the Network's members;
> Eventual possibilities of growth (or modification) of the Network in future projects, as well as its viability.
> Other agreements reached with associate institutions or institutions external to the Network.

Regarding the 1st item (degree of participation of each consortium member) the final perception is that there was an high level of engagement of all partners in the project activities. The organization of the consortium meetings held at Florianópolis, Berlin / Bremen, Porto, and Santiago / Temuco denoted a particular care from the corresponding hosting institutions, i.e. UFSC, TUB, UB, IPP, UP, PUCC, and UCT, respectively. The software used for the Internet broadcast was also a good contribution from UCT. The intelligent tutoring system and the Moodle extension for booking / scheduling remote experiments were two other important contributions from ITESM and UP, respectively. The project proposals submitted by UFRGS (in association with TUB and UB), ITESM, PUCC, and UP are also worth mentioning. All in all, it can be said that all partners gave their best towards the project outcomes. It should be mentioned that the project laid on a strong

social interaction among all partners, and therefore the level of engagement achieved was a natural result of that.

The partners used mostly Skype and other we-based video conference tools to communicate among them, in a synchronous mode, and e-mail, for asynchronous communication. . The several bilateral and consortium meetings provided unique spaces for face-to-face communication, in parallel with some events such as REV'06 (Maribor, Slovenia), ICL (Villach, Austria), and the International meeting on Professional Remote Labs (Bilbao, Spain), which had the presence of two or more RexNet project partners.

Several consortium members joined the recently formed VIT@LIS association, as founding partners. This non-profit organization will provide a future cooperation environment for RexNet, namely through a special interest group in Remote Experimentation to be created within VIT@LIS. This action also addresses the 4th and last item (other agreements), which also counts on some bilateral agreements, e.g. the academic cooperation agreement signed by IPP and UNISUL that will allow some students from the 1st institution (IPP) to visit and study at the 2nd one (UNISUL) during the 2nd semester of 2007.

II.5 Other aspects.

- Problems and successes met;
- Suggestions.

Problems: Bureaucracy associated with travel within Latin America, especially after the 11th September (e.g. visa requirements for Brazilian citizens wishing to travel to Mexico) and bank transfers from Europe to Latin America.

Successes: the level of interaction and enthusiasm among European and Latin American partners. Better and deeper understanding of work methodologies and pedagogical practices associated with e-learning, in general, and remote experimentation, in particular. Contributions from the partners to the DVD, in particular for describing the remote labs made available by the consortium.

Suggestions: strength the Internet connections between Europe and Latin America to support better access to Remote Experiments, which require a good Quality of Service (QoS) and a large bandwidth.