

Squeak in Spain as part of the LinEx Project

Diego Gómez Deck
Small-Land Project Leader
diegogomezdeck@consultar.com

José L. Redrejo Rodriguez
LinEx Developer
jredrejo@edu.juntaextremadura.net

Abstract

Extremadura regional government [1] has started to use Squeak [2] within the LinEx [3] project. Cooperation from the group Small-Land [4], devoted to spread the use of Squeak in the Spanish-speaking community all over the world, has allowed us to install Squeak in all secondary education classrooms.

1. Introduction

Extremadura regional government doesn't want to be left behind in the use of new technology. Therefore it has made a great effort to improve the education system in the region. A key point of this improvement is the use of computers as a tool in the class.

In order to make this revolution real, we have filled our classrooms with computers and installed free software. However this is just the first step, we have to achieve a more ambitious goal –all individuals must be able to reach the information freely, understand it and produce knowledge on their own.

We have to make the benefits of computers accessible to all. Accessible doesn't mean just providing computers for our students but enabling them to use them.

Here is where Squeak plays its role. Squeak is an excellent way to make the advantages of computers something real for every person.

“If a system is to serve the creative spirit, it must be entirely comprehensible to a single individual.” [5]

“Every component accessible to the user should be able to present itself in a meaningful way for observation and manipulation.” [5]

2. The LinEx Project

At the end of year 2000 Extremadura government decided to provide a computer for every two students in every secondary school built from that moment on. It was in that year that the regional government became in charge of education in Extremadura –up to then education was ruled by central government-. The Extremadura Secretary of Education, Science and Technology had set a plan of infrastructures which consisted in building 20 new schools to start working in the period 2002/2003. However providing computers for all these new schools was far too expensive. The price of software licences was too high. Besides, the property software need continuous updating and it was impossible to have access to code in order to make changes or adaptations. These difficulties led our politicians to the conclusion that the only way to carry out this ambitious project was by using free software. In April 2001 the first version of LinEx was presented. It contained the operative system and a large group of useful office applications, use of Internet, graphics, etc. This version was installed in the new schools.

From the beginning of the school period 2002/2003 teachers and students became familiar with computers without any problem. It wasn't a shock as some had predicted. Consequently a political decision was taken, to provide a computer for every two students in all public secondary schools in the region, all of them, from those recently built to those with a teaching tradition of many decades.

It is clear that this is not just a pilot project but a steady plan to make computers an integrated tool in the classroom. Teachers can take advantage of the potentiality of computers and students will get used to working with computers, something that they will need in the future.

2.1. Size of the project

The following figures will give us an idea of how important this project is bearing in mind that Extremadura is the region of Spain with the lowest per

capita income and has a population of slightly over a million people.

- nursery and primary education: 101,669 pupils and 7,290 teachers in 433 schools.
- Secondary education, A-level and Vocational Training: 86,155 students and 5,798 teachers in 119 schools.
- Up to now 60,000 PCs have been installed. There is one computer for the teacher and one on every two students desk in secondary schools. In primary schools there will be 3 or 4 computer rooms for every school.
- The virtual machine of Squeak and the image of Small-Land has been installed in all these computers in Spanish.
- Over 400,000 copies of LinEx have been distributed.
- An Intranet has been developed under microwave links. These links give a 2 Mbps bandwidth between schools, government offices, Teacher Centres, etc.
- The intranet is connected to Internet through an access of 20 Mbits.
- Each teacher has attended at least two courses on the use of LinEx and its more common tools. Some teachers have received more than two courses depending on the area.
- LinEx project is not focused only on education. From the beginning LinEx was applied to the so called ‘Technological Net’ of Extremadura. This tries to spread the used of ICT among all citizens by creating 33 ‘Knowledge Centres’. Entrance is free in all towns and cities.

In June 2003 it was calculated that Extremadura administration had saved more than € 18,000,000.

2.2. Agreements reached

At present an agreement to export the LinEx project has been reached with the regional government of Andalucía with a population of nearly 8 million people. Different regional governments have established working groups and keep in contact in order to extend the model. However this depends on the attitudes of different political parities. Internationally there have been compromises with the regional government of Porto Alegre in Brazil, with the very federal government of Brazil, the University of San Salvador (El Salvador) and the Department of San José (Uruguay). All of them share the same interests and objectives.

3. Squeak

Having computers in the classroom doesn't mean that they will be used or that they will be useful from a teaching point of view. Teachers noticed from the beginning of the training courses and the start of the technological classrooms the lack of suitable tools for them to elaborate and share contents and for students to learn those contents through the computer.

For some subjects as Foreign Languages, Chemistry or Mathematics some applications were installed, but these applications are not able to fulfill all the needs of teachers and students.

Teachers with some experience in Microsoft Windows would often request tools to produce contents and multiple-choice exercises they are familiar with. They wanted to be able to create displays and tables of exercises for students.

3.1. Needs

Anyhow we needed for LinEx a tool with the following features:

- Multimedia capacity.
- Able to develop and display contents.
- Easy of use.
- Able to take advantage of the potentiality of the intranet.
- In Spanish.
- Multiplatform so that teachers wouldn't have to change the systems installed at their homes.
- Adaptable to the specific needs of the region.
- Usable by student to express and simulate real systems.

3.2. A finding

In June 2003 some people working in the LinEx project attended in Dublin Guadec (Annual meeting of programmers and users of Gnome desktop) [6]. There they had the chance of attending the lecture of Alan Kay. All through the lecture were wondering what kind of tool that display was made with. Eventually Squeak was shown and they found out that it was not what they were looking for, it was a lot more than that.

Squeak allowed new teaching-learning strategies. It had the use of project repositories in it. With Squeak students would be able to program a computer at a very young age. The use of Smalltalk made it possible to work with it as a powerful developing tool.

Besides, it wasn't just suitable to our needs, it was totally modulable and could be personalized.

3.3. Small-Land

The only problem was translating it to Spanish. It is senseless to attempt the massive use of a tool in education if it is not in the users' mother tongue. Through Internet contacts with several Latin American groups of Smalltalkers, we finally met the newly created Small-Land. This group intended to spread the use of Squeak in education in Spanish. They guaranteed us that translation to Spanish was possible. After this it wasn't difficult to convince the politicians in charge of education to go for Squeak. It was worthy to spend time and money in making it known, in training the teachers, in making tools about Squeak and in developing Squeak itself by hiring experts in Squeak programming.

4. Implementation strategy

Having computers in every classroom brings about some problems in schools. Some have to do with facilities, space, electrical power, robbery or vandalism. However, the biggest problems are related to the use of computers in the class. Nearly all of the teachers and students are not familiar with the Gnome desktop and the applications that come with LinEx. Worse than that, a number of teachers don't even know how to use a computer, and some don't even want to know. Students are likable to waste time searching the Internet or playing computer games. Furthermore, many teachers who would use computers don't know what to do with them.

Obviously, some of these problems can be solved by putting money in physical resources and training lessons for teachers. But this is not enough to convince someone to set the computer and work with it in a class.

Some important conclusions were drawn during the first year in which 20 schools had computers in their classrooms:

- When teachers are shown very specific tools to solve concrete problems of their subjects, they willingly spend time in learning to use them, improving them and producing contents with them.
- Students request using computer in the class.
- Computers motivate students, put them to work and allow self-learning adapting to different levels and abilities.

These same problems and conclusions could be applied to Squeak. It provided an easy environment to generate contents but it brought a new challenge concerning teachers. We aimed at using Squeak not only as a content generator but as a new teaching method based on practical activities which make students get involved in their own learning. This may entail changing routines in teaching methodology, which is not easy for teachers and may bring about a little aversion for Squeak.

The plan could be resumed in: *"to fill today wants with Squeak while we build the basis to come about with more interesting applications that Squeak could provide.."*

In order to fill the more urgent wants we are working on the use of Squeak to create Active Essays because this way Squeak can be used in different subjects, not only in Science where eToys are easily fitted. Part of the plan is teaching to use scripts of eToys as a part of the Active Essays. We also intend to add some applications which can generate linguistic exercises, graphics and so on. Teachers are used to this because these exercises often come with the text books in a CD.

In the first training courses we have noticed that a small, but not ignorable, number of teachers are interested in the use of eToys to make students more active in the learning. The strategy includes in giving those teachers a special support in their daily work with students so that they can "infect" other colleagues later on. When we have a group of teachers trained the possibilities increase enormously.

5. Current achievements

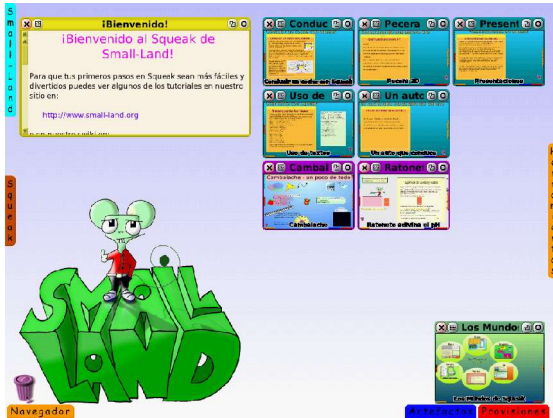
Since project LinEx/Small-Land started in mid 2003 we have reached some goals we had attempted from the beginning.

5.1. Small-Land Community

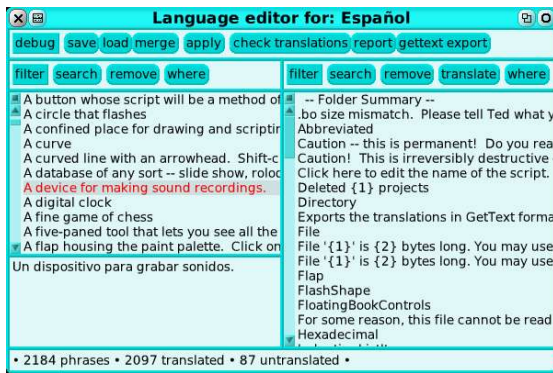
To faster the use of Squeak in teaching in Spanish speaking countries we needed a group of experts in IT and teachers working together. That's why Small-Land was born. Small-Land has computer programmers and teachers from Argentina, Spain, Peru, Ecuador, Uruguay and other places. We have a mail list and a swiki where we can check all the information concerning the project. The group is launched but we need more teachers committed to the project.

5.2. Squeak in Spanish

We needed a Squeak in Spanish. This includes not only the eToys environment but all the user interface – menus, flaps, project publishing/searching, object catalog, file-list, etc. We developed a simple translation framework called Babel which is the basis of other translating projects (German, French, Italian or Portuguese for example) and will be included in the next Squeak version 3.7.



To speed up the task of translating, Babel has a tool which any user can translate with even if they don't know Deep-Smalltalk.



Babel also has the capability of export/import .po format files (from gettext project). With this option one can use some of the excellent available tools

5.3. Teaching stuff in Spanish

Another objective was generate teaching stuff in Spanish. We've reached a high amount of contents in Spanish. We've worked in two ways, translating already existing stuff in other languages (The "Powerful Ideas in the Classroom" Book, the Squeakers DVD, Tutorials from FunFunFunSqueak,

Tutoriales from Squeakland, etc.) and making up our own stuff (Tutorials, Squeak documentation, etc.)

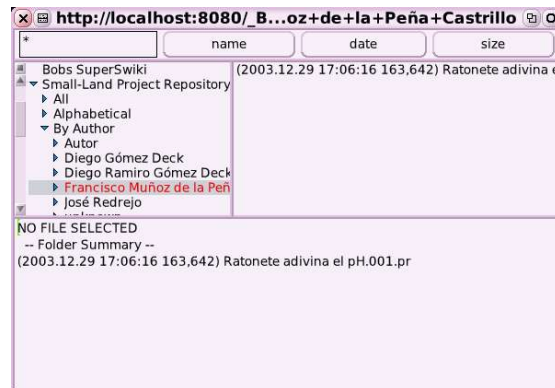
5.4. Training teachers

We have carried out two courses for teachers and teacher trainers and new courses are coming (two training courses for 30 teachers every month). We've also started lessons for working groups of who are already familiar with Squeak. This way they have places and facilities to carry out their projects.

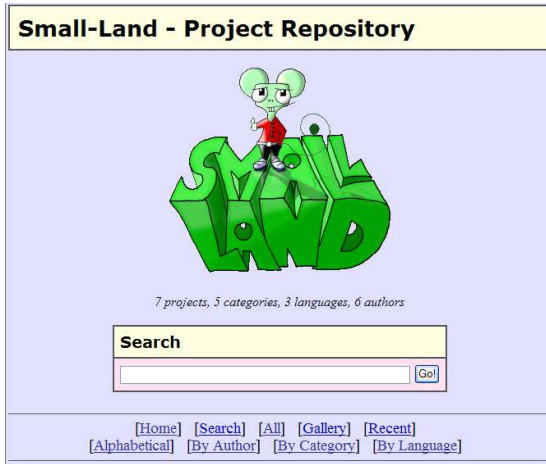
5.5. Infrastructure

The size of the project brings about some logistic difficulties. 60.000 computers running Squeak requires an infrastructure able to hold installations and updatings at a low cost. We use the mechanism included in LinEx for installing. In order to carry out updating, the images established have an option to update them with the changes published in the Small-Land swiki. These changes can be written on the code, in the projects included in the image or the translations.

Due to the size of the project, another necessity was to have a project repository similar to SuperSwiki which also includes the possibility of the user-interface translation together with searching and classifying options. To solve this we developed a project repository which can be accessible from Squeak and from a web interface. To change the current publishing and searching project mechanism as little as possible, the repository simulates directories based on the information in the uploaded projects and facilitates searching using the current File-List. For example, a project in the Maths category can be found in the directory By Category/Math, but also in the directory By Author/Author's name, in the directory By Language/Spanish, in the directory All, and so on.



The web interface works with virtual folders but it also has a searching option.



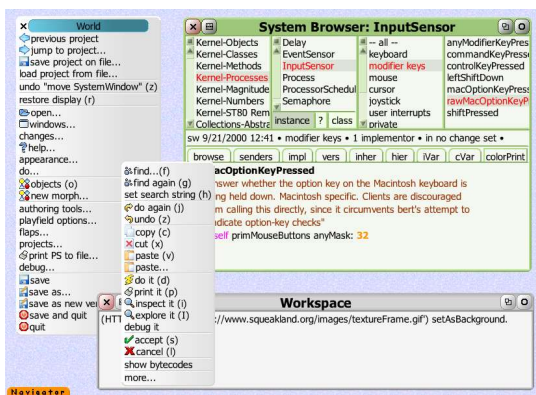
5.6. Making Squeak more attractive

We've made a great effort to improve the look and feel of Squeak so that the potential users receive a good first impression. We basically focused on two points, general look and fonts.

As for improving the general look we used the changes made some time ago by some Small-Land participants which improved the look of the windows, menus, scrollbars and some dialog as the FillInTheBlank.

As for fonts we use the TrueTypeTextStyle package, installed the free Bitstream Vera Fonts and removed many of the hardcoded references in the code to the previous raster fonts.

All these changes are already included in the coming Squeak 3.7 version.



5.7. Working with the Squeak community

After going through different stages, Squeak Community seemed to have reached a common view about modularization. This agreement, apparently harmless, combined with a lack of direction (or with many directions which come to be the same), was weakening Squeak instead of improving it. A big effort to segment the image, little or none to make it grow.

This situation was dangerous for the Small-Land project because it depends on a complete Squeak. It couldn't be based on the Squeakland image because is just been made suitable for eToys.

After several discussions with some members of the Squeak community we concluded that the only way to prevent a fork of the project was to appoint somebody from Small-Land to be in charge of the so called Media-Squeak (or Full-Squeak). Media-Squeak means simply following the philosophy which ruled the development of Squeak during the period SqC (Squeak Central).

This was proposed and approved in Squeak-Dev.

This way we have prevented a very likely failure of the project and nearly all changes and improvements done in Small-Land are in the next version 3.7.

After releasing version 3.7 of Squeak the image of Small-Land will be build up on a Media-Squeak 3.7.

6. Still some way to go

6.1. Reinforce

- Teacher training.
- Practical lessons for teachers who have already attended training courses and are working with Squeak
- Making Small-Land the meeting point for Spanish speakers interested in the teaching possibilities of Squeak.
- Selecting leading teachers to show other colleagues.

6.2. Start

- Modules to import into Squeak contents available in other formats (Flash, SVG, ...)
- Replace some "traditional" teaching applications by Squeak versions.

- Training of a group of programmers Deep Squeak (Smalltalk) to support and development.
- Squeak free-time activities for children of all ages.
- Try to replicate this experience in other Spanish speaking places or non Spanish speaking.

7. Conclusion

The road seems not free from obstacles. The size of the project and the general spreading attempted bring about difficulties such as equipment infrastructures, possible negative reactions and unwillingness to change.

However,

- the features of Squeak which is the result of the experience of more than 30 years,
- the strong motivation of the people involved in the project
- and the fact that we are convinced that improving of education is the best way to make a better world

reassure us that benefits are worth taking the risk.

8. References

- [1] <http://www.juntaex.es>
- [2] <http://www.linex.org>
- [3] <http://www.small-land.org>
- [4] <http://www.squeakland.org>
- [5] Dan Ingalls, "Design Principles Behind Smalltalk", *BYTE*, August 1981.
- [6] <http://www.guadec.org/> - <http://2003.guadec.org/>