“write a thesis. get a laptop. change the world.”
Supporting grassroot movements with a contest:
The XO-Contest of the Swiss OLPC group

by

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Abstract: There are many ways to support a grassroots movement or an open source project. About three years ago, the Swiss OLPC Group (“one laptop per child”) decided to make a contribution to the worldwide movement by launching a local contest. The aim was to produce either software code or a written work of free choice, be it in the scope of information science or education. To be as open as possible, the contest was aimed to the target individuals or groups of school classes of any age, pupils, students, scientists, hackers or geeks. As the prize, the winner would receive an XO laptop, the device specially designed for OLPC. Though the participation was modest, the contest was worth the effort thanks to the publicity, which opened doors in the government and for donations to come in.

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Introduction

“One laptop per child” (OLPC) is a U.S. American non-profit organization, co-founded by MIT professor Nicholas Negroponte in 2005 and announced for the first time at the World Economic Forum in Davos, Switzerland. Best known for the "100$ laptop", which is really named "XO" (and costs nearly 200$), the movement is often misunderstood as a pure hardware orientated project rather than the education project which it is. The XO laptop along with its free and open source operating system and learning platform called Sugar, is a complete tool for education, helping the children to "develop the passion for learning and the ability to learn how to learn." [1] Sugar “is an alternative to the ubiquitous computer desktop metaphor that has dominated computing since its invention at Xerox PARC (Palo Alto Research Center) in the 1970s.” [2] This makes sense, since “children are not office workers, nor does anything in their future resemble office work from 30 years ago.” [2] Most important, Sugar is not limited to the XO device, but runs on any Linux system and in a virtual machine on other systems e.g., Windows and MacOS. can even be run from an USB stick without impairing your system! [3]

Therefore an important part of the movement is the development of learning software in the tradition of the work of Seymour Papert. Although the goals at the beginning appeared to be way over the top, OLPC with its more than two million educating laptops in Latin America, Africa, Middle East, Australia and Asia is a success story today. It no longer is a question of whether or not the system works, rather a question of how can we together ensure that children all over the world are able to reap the benefits.

Apart from the OLPC Foundation, there are countless grass-root movements related to the project in cities all over the United States and in most countries of Western Europe. Most of these groups are legally constituted, so is the Swiss movement a "Verein", which is similar to the US based OLPC Foundation. While most of the European groups are mostly technically driven, the Swiss group due to the composition of its members is more educationally oriented. Furthermore, because of the rather small group, the objective initially was merely to spread the word, to gain new insights through small local prototype projects and to raise money to fund projects of third parties in developing countries as well.

One day the idea of a local contest came up. What, if not 'Activities' is the core of grassroots movements? Incidentally the software programs that run on the XO are also called 'Activities'. In one way or another, all of the objectives of the group could be supported by such an Activity!

Organizing the contest

As an incentive for participation OLPC Switzerland wanted to provide XO laptops for the duration of the contributing projects. The XO was an uncommon sight, not available for retail to the general public. The charming little green laptop always happened to be an eye-catcher where ever it was shown. People were naturally drawn to it and always asked, where they could buy such a laptop. Therefore it was hoped to motivate interested people to participate in the contest when in return they could hold one of these "precious ones" in their own hands. On top of that, the winner could aspire to win as a prize an XO that they would own and keep.

Since there wasn't a large enough stock of devices for that, the OLPC Foundation was asked to deliver some laptops for the contest. This process alone took about half a year. At the end we received 20 XOs through the OLPC Contributors Program [4]. The contributors program is open for everybody to apply and through this long established institution, the OLPC Foundation grants XOs and mentoring for qualified and selected projects. After applying by sending a proposal in a standardized format the projects undergo a community review at a weekly on-line meeting, where you have to answer critical questions and win a mentor for your project if selected.

Parallel to the procurement of the XOs, the question of funding was raised. The Swiss OLPC movement itself possessed almost no money to cover costs like shipping, marketing, traveling costs for mentoring etc. Fortunately the Swiss "Hasler Stiftung" [5], specialized in funding projects which support education in computer science in Switzerland, granted a substantial amount to run the contest in a very informal way.

The third part of the preparation for the contest was the launch of an online platform for the competition. Since the contest had been planned as a Swiss action, the domain "xo-contest.ch" was registered along with web hosting. The platform itself was designed with Drupal, which delivered all required modules out of the

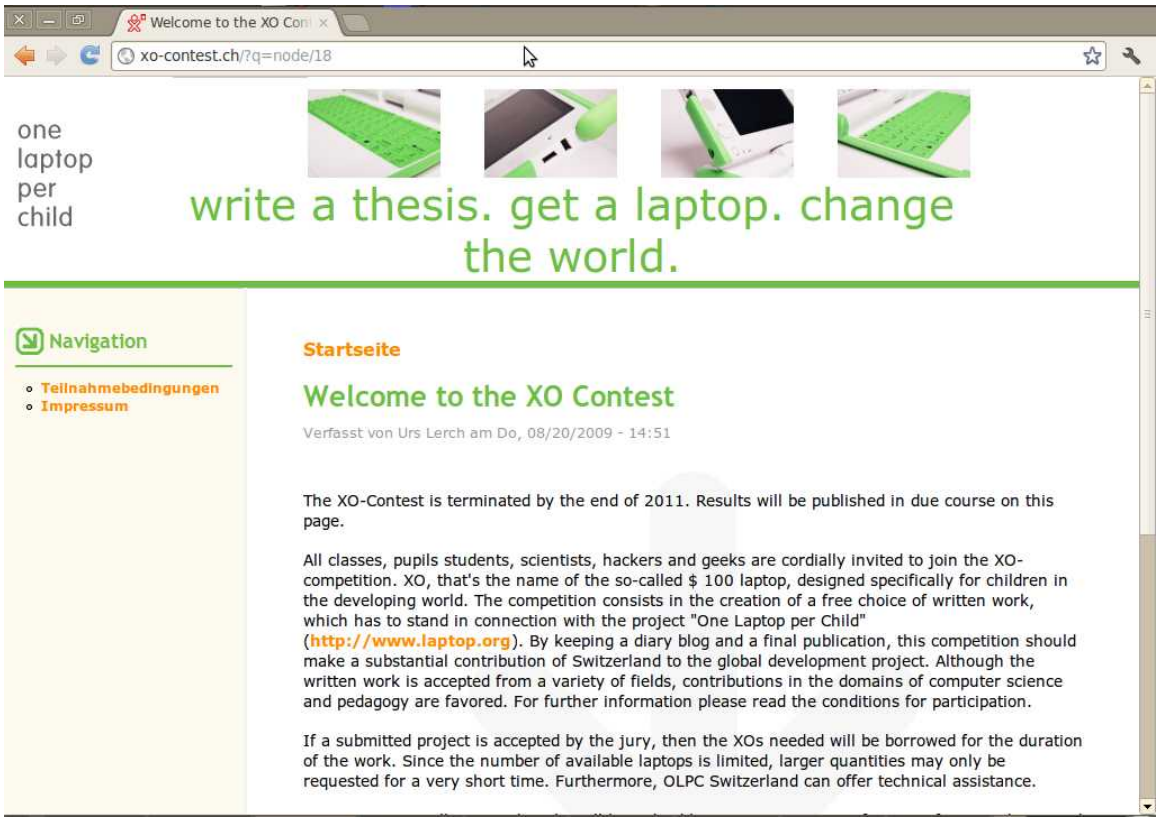

Figure 1: The contest announcement on www.xo-contest.ch

box. A standard skin was adapted to better match the look and feel of the OLPC design. Since there are four different national languages (German, French, Italian and the small minority Romansh) and the "unofficial fifth language" English, which is mostly used in the academic world in Switzerland nowadays, all content had to be translated in multiple languages. Luckily, sufficient volunteers agreed to do the job.

Finally, the platform delivered the invitation to the contest and the conditions of participation as open accessible information. To participate, all one had to do was to register. At the beginning, the only option for a registered participant was the acquisition of an abstract. The abstract was visible only to the registered participant plus the jury of the contest. Once the proposal has been accepted by the jury, the participant was asked to inform the public by creating and maintaining a blog on the platform. Unfortunately, none of the participants used this feature that was provided.

All accepted applicants were assigned to be looked after by a personal mentor. To guarantee this job, several community members with very different specialties were asked. A lot of persons committed themselves to do the job, if their skills were needed. Unfortunately, at the end only very few people stood to their promise. An experience that is not uncommon to a lot of projects of this kind and we had to find a way to deal with it.

The contest was announced through different channels. At several exhibitions flyers were distributed. All the relevant mailing lists of the two target groups of computer science and education were addressed. An article was published in the most important Swiss computer magazine [6]. Furthermore, the network of the team was activated and from a lot of personal contacts, potential participants were motivated to participate.

The competition was originally scheduled for a period of one and a half year, beginning in early 2009 and ending late 2010. But due to the problems with getting hold of the required laptops, it started almost half a year later. During the contest it was decided twice to extend the duration, with the expectation of getting more participants. Finally it lasted until the end of 2011.

From the point of view of funding for the contest, because of the extended duration, the real costs didn't correspond to the budget in most parts. Naturally the payment for domain and web hosting was double the budgeted amount. Most of the publicity material and mentoring costs was supported by the team. And since the participation was lower than expected, the expenditure wasn't that high anyway. Furthermore, at the beginning there were plans for several events for kick-off, presentation of interim results and a closing ceremony as well. The kick-off had to be canceled due to the delayed start. The organizers then gave up the rest of the planned events, as the results were less than satisfactory. Since most of the work had been done by non paid volunteers and largely overruns and savings offset each other, the budget could be met on the whole.

Contributions

Overall, only seven proposals were submitted. One of these had to be rejected because the applicant already had a set of laptops using the Windows OS. And since they needed more laptops they had hoped to be able to apply through our contest and obtain the additional XO laptops that they needed to be able to complete their project. However this path was not possible as they had not realized that the XO laptop had a different operating system (Sugar) and they couldn't mix and match the XO s with their existing laptops. This example shows once more, that the "100$ laptop" was widely seen as a pure hardware project and not an education project. Two of the proposals were accepted but never completed: For one of them it turned out that the available XO device of the first Generation was not powerful enough for the intended project and the other applicant simply didn't find the time to implement his plan. This left us with four final accepted projects to evaluate for the contest.

Car Counter

Due to an early presentation at CERN, the European organization for nuclear research in Geneva, contacts to several persons of the organization had already been made a while ago. One of these, the post-doctoral fellow Öznur Mete, posted a proposal to the contest. The intention was to develop a car counter.

Through a light sensor an object passing by in front of the detection station shall be detected. Subsequently, the sound of the passing object will be captured by a sound sensor. If the noise is loud enough, the object is recognized as a car and the counter increases. A more detailed description of the project can be found on Öznur's homepage [7].

Since Öznur already had experience with the picoboard [8], she decided to take this additional hardware as a base. From the perspective of OLPC this was not really desirable, because the picoboard meant an additional purchase. But as the contest should preferably have low entry barriers, it was accepted nevertheless. Hopefully someone else will take the existing solution and adapt it to using the internal camera and microphone of the XO device.

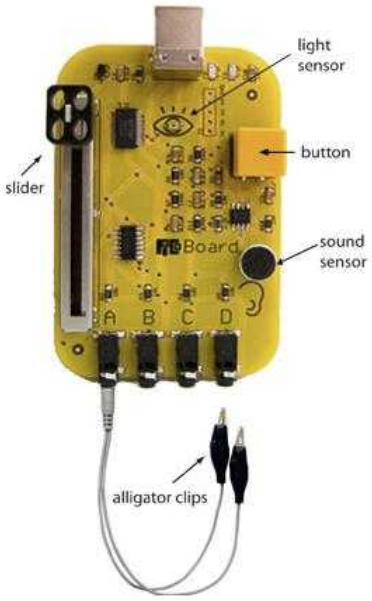

Figure 2: The picoboard for the car counter (picture taken from http://www.picocricket.com/picoboard.html)

The software code [9] is written in Scratch, which "is a programming language that makes it easy to create interactive stories, animations, games, music, and art" [10]. Scratch is one of the most important applications on the XO device, but works also on many other operating systems. Since the programming language is designed to be applicable even by kindergarten kids and elementary students, the project at issue can easily be modified by the actual users of the XO. Therefore it is conceivable to count other objects than cars that might be more obvious to the target group of 6 to 12 year olds.

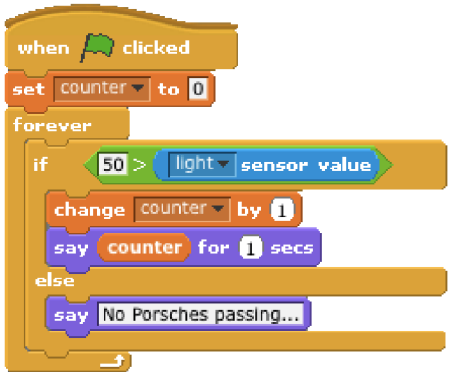

Figure 3: The car counter implementation in Scratch

The car counter principally works therefore the application can be called as successful. Nevertheless, to fully satisfy the needs of the OLPC movement and their target group, there would need to be some adjustments made as described above.

Children Laptop Orchestra Performance

The contact to the Swiss musician Marco Maria, living in Berlin/Germany since the end of the 80ties, was made by a friend seeing the musician playing live on stage on a very early version of the XO device. [10] Samples on his home page [11][12] showed in an impressive way, what he was capable of doing with the laptops as a professional musician. In several conversations the idea of a Children Laptop Orchestra Performance was developed and officially proposed by Marco for the contest. The idea was that guests or former respectively following performers of electronic audio art festivals would be invited to improvise with the samples of the "TamTam Mini" software on several synchronized XOs. The event ideally would be supported by a DJ/DJne/musician and a technician who helped to coordinate by sending the signals from all laptops used through the local wireless mesh-network and lead them into a mixing desk and/or a main laptop. Marco Maria as coordinator would produce smooth floor-tracks, coordinate and remix the signals and sounds received from the guests on the local area and the guest musicians.

The main aim of the planned project was:

a) To explore the possibilities of producing a satisfying musically and interactive performance on the XO in order to demonstrate the dimension of this amazing computer as well as to stimulate children and their teachers all over the world to develop similar performances.

b) To pose a challenge for "serious" musicians and composers to produce works for school classes and children's groups, using the prepared tools of the "TamTam" software suite, as also new samples.

c) To present the technical challenges of the mesh network in use as a real-time audio-stream and live mix.

This proposal resulted in a slightly smaller event in the end than initially planned, but was a very innovative experiment. The team, consisting of Marco and Malte Reißig, was invited by the yearly music fair "alltogethernow" in Berlin, and a "Sound-Bar" was installed for a period of two hours. At this venue passing participants of the fair were encouraged to play on the small bright green laptops with the brilliant children's sequencing software "TamTamEdit" and improvise to the running floor-track. The only sound source was the built-in mini speaker units. There exists a short video of the "Sound-Bar" [13] which gives a clear impression of the atmosphere.

The main issue was that the sequencer software couldn't be synchronized across multiple devices. Although the laptop software has been generally designed for cooperation, most of the applications don't support that feature, which is a bit of a disappointment. Furthermore, the hardware is a bit too modestly built for audio productions. Hopefully, future devices of the XO series will be more suitable for elaborate audio experiments. Another minor disappointment for Marco was to learn that his pre-mass-production XO had some finger pad features, which got lost later on (see his demo features).

Not so surprisingly, however, was the fact that the volume of the built-in speakers of the laptop had often difficulties in drowning the noise of the surroundings like ventilation and so on. Originally it was planned to do a performance with distributed amplification, but at the last minute there was no money for it. This was actually quite good in hind sight, for this way it was more like the natural environment that children happen to have.

As a conclusion, the event did happen but the orchestra was quite a bit smaller than previewed. For a final assessment a second, slightly extended trial should be started. It seems reasonable to wait for the XO-3 before starting a second attempt, since as far as we see it the hardware of the new device should be sufficient for a larger setting.

Intercultural Radio Play Production

On the German OLPC-Mailing list Tom Staubitz posted his interest in writing his master thesis in International Media and Computing at the Berlin University of Applied Science in the context of "one laptop per child" [14]. At about the same time the German non-profit organization Radijojo [15] asked if there would be interest in the OLPC community in producing an inter-cultural radio play. Bringing the two together and promising to deliver the needed amount of XOs for the duration of the project, Tom could be motivated to propose his master thesis project to the XO-contest.

The goal of the project was to produce a radio play fully with the XO laptop. In a week long workshop with nine year old elementary students the play was to be written and recorded together in class. It was thought of having some kind of interaction with a partner class of South America as topic of the play. Result was not only the radio play, but also a manual for further projects.

During his work Tom posted his experience on his blog [16]. This way, the blog was not only a good possibility to participate from a distance but also the descriptions of the bugs and shortcomings of the software that

were received by the community could at least be partially resolved in future software versions through the interactions. Further, for Tom it was an excellent experience, getting direct feedback and also a reputation in the OLPC community.

The workshop lasted a full week of five days (but only for four hours a day). A school class of nine year olds of the Anna Lindth school in Berlin, ten people from Radiojojo and seven XOs worked in six teams to create the radio play. Unfortunately not everything could be done during the workshop. Due to the restricted time a lot of things had to be prepared in advance, which otherwise could have been done with or by the children. The restriction to use only the XO for the production of the play caused some problems (and limitations), but mostly worked by the end. Thus the children used "Write", "Record" and "Paint" for their work.

Figure 4: Choir singing lowres for the radio play

For the mixing and animation, the existing tools like "Audacity", "Scratch" and "Etoys" could not meet the expectations on the XO. On the one hand, there was no time to learn these more complex tools. On the other hand, the kids had a restricted attention span and they preferred to play "Maze" or make "Speak" say nonsensical things. Beside this, the hardware configuration of the XOs was partly not sufficient. Therefore, mostly the teachers switched to their already well known applications on their own computers.

Figure 5: The children loved the XO during the radio play production

Originally, the play was intended to be an international and inter-cultural story. Therefore partner schools had been contacted in advance. Although there were some commitments, at the end it was not possible to collaborate across borders. Which was a pity from the perspective of the content, but it didn't impact the production side and the writing of a manual.

Despite the described problems, the workshop was a success and the radio play has been aired [17]. “Nevertheless, the kids loved the XOs and the workshop was a success. The question each of the kids asked, was, where they can buy an XO and if they are sold on ebay. At least one of the parents provided Sugar for the PC that is used by the kid at home. All of us definitely had a lot of fun." [18]

But the radio play was not the only result out of the workshop. Tom has finished his master thesis [19] and a manual [20] for further radio play projects. The latter is also accessible on the platform "flossmanuals.net". As a conclusion, this project was prepared and carried out in a very professionally way. Therefore it was not surprising that the results were also truly awesome.

Project week azo Training Center

The "azo" is a training center for apprentices in industrial occupations, located in Winterthur, the fifth-largest city in Winterthur. Samuel Etzensperger responsible for the computer science department observed for some time an interest by his students in the OLPC project. Therefore he developed the idea of a three day long workshop in connection with the XO device. He then submitted a total of four proposals. Due to the fact that it concerned apprentices the four proposals were not particularly innovative. Nevertheless, the applicant thought at the beginning that his projects could make an impact in the OLPC community. This fact brought to light another common misconception. It was obvious that a lot of people do not realize that the OLPC project has a strong academic background and was not only on the cutting edge of science, but in many respects, even advanced the innovation. Although no greater impact could be expected, the proposals were accepted with some adjustments. The contest team hoped to raise a brighter awareness by the young people for the OLPC project through the workshop and hoped that maybe, one or the other would become an active member of the community.

At the end, only two of the four projects succeeded. The idea of a WEB/Community-server was dropped since it already existed and had been in use in several schools for a long time. A second intention, connecting a microscope to the USB port had also failed in the earlier attempts to install the drivers.
The remaining two projects were a "solar power case" and a "WLAN test".

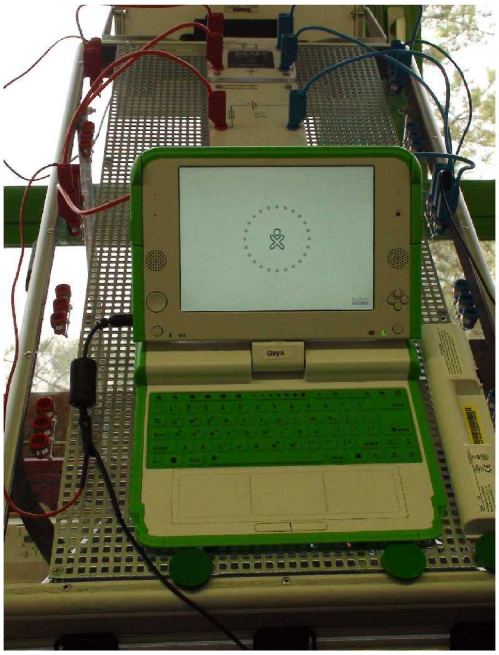

Figure 6: Solar power case

The use of the "solar power case" showed to the students that indeed an XO can be supplied with "free" electricity. This fact is already well known in the community and there exist a lot of working environments with or without solar power, although the original hand cranked winder to power the device had to be dropped primarily due to reasons of robustness. Since the laptop is also intended to be used in areas without electricity at all, the issue is still quite topical. However because the "solar power case" would cost approximately $ 2000 it was not an economically viable or feasible option for use in the OLPC project environments in developing countries.

Assuming that the "solar power case" is getting cheaper, it could be quite interesting for the OLPC project, because, besides the possibility to charge the laptop, it also offers interesting educational content. The solar case contains a variety of electronic components attractively presented. The children can thus use/work with the existing circuit and build basic electrical circuits. Through the use and handling with sensors, batteries, lamps, switches, and photovoltaic cells, they can get an insight into power generation and processing. Because of this, it would

certainly be a great thing to develop such a "solar power case" within the scope of OLPC, leading to much cheaper and possibly locally produced components.

The second project too, a WLAN test, could not provide new information to the community. Nevertheless, it was a good experience for the students to practice their skills and to get to know more and understand the XO better. First they tried to replace the built-in WLAN adapter with a big external antenna, for getting a connection as far as possible. Once again, this intention failed due to the impossibility to install the needed drivers. Therefore the project team decided to just do a comparison of the WLAN adapter of the XO with the one on the regular laptops that they used. Surprisingly they found that the adapter of the XO was superior to the one of the regular laptop. Outdoors a wireless connection with the XO could be maintained up to 900m and inside the building too the XO showed a better wireless performance.

Both projects were adversely affected by insufficient time. In particular, the time it took to understand the system in terms of hardware and software, has been greatly underestimated. The apprentices were partially impressed by the hardware, although the laptop was too small and too slow for their habits. They determined that they have learned a lot about hardware, software and power consumption. More generally, they find the OLPC project is a good idea. Another side effect of the workshop was that a representative of the Swiss education platform "educa.ch" visited the workshops and was excited about the XO.

And the winner is...

Finally, there was only one application that really fully fulfilled the claim to make a substantial contribution to the global development project. So for the contest team it was pretty easy to name Tom Staubitz with his Inter-cultural Radio Play Production was declared the winner of the XO-contest. Not only did he succeed in producing and releasing an interesting radio play, but with his written manual he gives interested people an amazing tool in their hands to follow his path. Furthermore, his blog entries have led to various improvements in the software pre-installed on the laptop. The XO-contest team therefore congratulates Tom and thanks him very much for having donated his prize to a project in Tanzania!

Conclusion

Despite the broadly announced competition, there were only seven participants, of whom six could be selected. Of these six two projects weren't finished. In addition to the four successful projects, the publicity of the contest opened a few doors in the government at least a little bit and led directly to small donations. Therefore, the outcome was certainly not as rich as hoped, but was a good beginning and the contest contributed substantially to a broader knowledge of OLPC in the public as well as in governmental institutions of Switzerland.

Promoting the contest through several channels led to the conclusion, that the most successful way was through personal contact. In addition, that it is a very time consuming activity so we mostly reached persons that were already active in the community. We therefore conclude, that a contest like ours might be a motivation for contributors in their work, but isn't the best way to win new contributors.

Another experience for a successful proposal is that you either have to have a participant who is very self motivated (for example through the deadline of a thesis), or you need the participant to perform very closely. The latter is not only a question of personality of the mentors and acceptance by the participants, but also very time consuming. Therefore, one can easily say that an activity as the XO-contest should be carried out by as much persons as possible and with an adequate budget for mentoring time.

About the author

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Notes

[1] http://one.laptop.org/about/education
[2] http://wiki.sugarlabs.org/go/What_is_Sugar
[3] http://wiki.sugarlabs.org/go/Sugar_on_a_Stick
[4] http://wiki.laptop.org/go/Contributors_program
[5] http://www.haslerstiftung.ch/
[6] http://www.itmagazine.ch/artikel/art_details.cfm?aid=11419
[7] http://omete.web.cern.ch/omete/OM/picoboard_project_files/ISOTDAQ_HW2.pdf
[8] http://www.picocricket.com/picoboard.html
[9] http://omete.web.cern.ch/omete/OM/picoboard_project_files/CarCounter.sb.zip
[10] http://scratch.mit.edu/
[10] http://marcomaria.com/?p=937
[11] http://www.mariamusic.de/audio/Afro000.mp3
[12] http://www.xo-contest.ch/Session.flv
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[14] http://lists.laptop.org/pipermail/olpc-de/2010-June/001719.html
[15] http://www.radijojo.de/
[16] http://www.flatlandfarm.de/blog/?cat=5
[17] http://www.radijojo.de/the-movement/page/unten.php?butre=Sendungen&punkt=olpcannalindh&audio=radiofuturadasersteolpchoerspi&audioname=Radio%20Futura:%20das%20erste%20OLPC-H%F6rspiel
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