The PracTEX Journal, 2007, No. 1
Article revision 2007/03/03

The "hacking for learning" paradigm in LaTeX — Some thoughts by a long-time LaTeX user

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Abstract This article argues a case for making hacking an accepted way of learning. It uses the example of LaTeX to show why hacking is not so bad, as it is made out to be. It also gives some warnings on the down-side of hacking-for-learning.

1 Preamble

For several years now, traditional teaching, or learning, has been based on some well-known and accepted practices of instruction. Such methods have been continuously studied, and improved, using theories of cognitive sciences, psychology, pedagogy etc. Recent technologies have introduced a new way of learning, which proves to be far more effective than all traditional methods. This method of learning – known as **hacking** – has become a practical way to learn, although many traditional schools still do not recognise its effectiveness.

1.1 A question of definition

We will not launch yet another polemical debate on the meaning of hacking. The term has several usages, and meanings with several shades. In fact, a quick consultation of Wikipedia shows that there is a plethora of definitions of the term **hacking**, and a whole lot of controversies regarding its usage. The term, **hacking**, is often misunderstood, and used unfairly, in a derogatory sense. The

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"*New Hacker's Dictionary*, third edition" by Eric S. Raymond and published by MIT Press in 1996 is a highly relevant work, since it defines "hack" and related words based on their initial use: 1) making a quick (perhaps dirty) change to a system, and 2) doing something incredibly tight and elegant. In simple terms, **hacking** is the act of *ripping open an existing product, and modifying it, to examine its working*. In this article, we will use the term **hacking** in this sense. *Thus, this is not a universal definition of the term*. The question of any motives, or intentions, is deliberately kept out, and is not relevant in this definition. For this same reason, the author feels that the term *ethical hacking* is an unnecessary redundancy.

Hackers have unfortunately earned the reputation of being crooks, or outlaws, who snoop into other people's privacy, and exploit them. This is often true, but not always. The French have a nice word for this class of people – *bricoleurs*. We could also call them – *explorers*. In fact, FLOSS celebrities like *Linus Torvalds* or *Richard M Stallman* take pride in being labeled as hackers. Our definition given above, also follows this trend.

Hacking has become a culture, and a way of life, for people who have to depend on self-tutoring. Hacking is a very effective means of learning several subjects e.g. scripting languages like Python, and Ruby, HTML, Linux, shell scripting, and LaTeX in a way, hacking is also used by people who wish to learn playing music. They pick up a known tune, score, or song, and try to play it by themselves. With some amount of trial and error all these people succeed reasonably fast.

The aim of hacking in LaTeX is to get a feel for the commands used in the original text. The LaTeX hacker is not interested in the contents/text. Since the original text will not be pilfered, the hacker need not feel unduly guilty.

Those who wish to protect their LaTeX documents from hackers, always have the possibility of first creating the LaTeX text, and then converting it into a closed format, like PDF. Thus, hacking poses no major danger to LaTeX users. When a closed format, like PDF is used, even the commands are masked. Only the rendered version will be visible.

1.2 LaTeX and hacking

LaTeX is eminently suitable for the "hacking for learning" paradigm.

1. LaTeX is a very rich language, with a very complex command repertoire. The

learning curve for LaTeX is very flat. We could make it steeper, by hacking.

2. GUI tools and IDEs like Kile or Lyx can offer only very limited support and prompting.
3. Hacking helps the learner to figure out how exactly to use a command. It is easy to use hacking, to verify what exactly a command does, or get answers for "what-if" type of questions. All that is needed, is to re-compile the source and view the results. This experimentation is often much faster, and more effective than the task of actually referring to lengthy books and manuals.
4. Professional typesetting is a very profound subject. Many aspects of this subject are not easy to visualise. In addition to the commands, LaTeX texts depend on supporting resources which are "imported" by the user. This includes, documents classes, style sheets etc. The best, and the only way to appreciate these, would be to use them on some hacked text and try out various commands.
5. As the learner gains confidence in LaTeX commands, the need to hack will gradually go down. Hacking is not an addiction in this case.

One must recall that a person is not always obliged to depend on others for his hacking needs. The learner can hack his own documents also (auto-hacking). Once a person has created a good document which suits his tastes, he can preserve it as a template document. He can build on this document, and similar template documents (containing other commands) and create richer documents. This will save considerable time for the user. The user can gradually build up his LaTeX skills using this approach.

2 The downside of "hacking for learning" approach

The author insists that hacking is only a supplement, and *is NOT a replacement for traditional learning methods*. Hacking must be used to reinforce traditional learning modes, and to accelarate the pace of learning. However, the following points must be kept in mind:

1. The learner may get a false sense of having mastered LaTeX due to the short-term success he sees.

2. The reason for using a certain command, is influenced by the context in which that command is used. This will be known to the learner only if he supplements his efforts with some reading and profound analysis.
3. The unscrupulous hacker may go beyond just innocent hacking.
4. Hackers have a habit of jumping to a conclusion, without actually thinking about the consequences and side effects. Excessive dependence on the "just do it" attitude will make hacking-for-learning a counter-productive exercise. The hacker may actually be losing time, instead of gaining time, because of this.
5. In the LaTeX world, like everywhere else, there are good programmers, and there are bad programmers. If the source document used for hacking is badly chosen, the hacker will have extra trouble trying to figure out, why things are done in a certain way. Or, he may end up learning the wrong way to use a command.
6. Hackers should possess enough discretion to recognise texts which do not need the help of hacking (like the current paper). In many cases, the prompting offered by front-ends like Lyx or Kile is enough. In such cases, **not using hacking** would be a faster way to create LaTeX documents.

3 Summing-up

The message this article tries to convey, is that hacking should not be denounced systematically. A certain proportion of the learner's time should be alloted for hacking existing LaTeX documents, so that the learning process becomes faster. The learner's confidence builds up when he sees success.

An overdose of anything can be lethal. Hacking, when practised in moderation, *along with other forms of learning*, can be an excellent way of jumpstarting the learning process for LaTeX . The author, who is a confirmed teacher, and a compulsive hacker, should know.

A sequel to this article will discuss certain principles of hacking, for LaTeX learners.

4 Postscript

This article was prepared under Suse Linux 10, using KDE-3.4.2 b, and the Kile 1.8 front-end. Hacking was not necessary, in view of the simplicity of the text.

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