BIJLAGE V

Teaching TEX: Critics & LATEX proposal [1]

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Abstract

Some critics — mainly LATEX based — on the approach are given: TEXnically driven instead of result driven. Also is notified the omission of a general pedagogical method to be used. Furthermore, it is urged to have unified courseware. A set of LATEX courses is proposed. No test set is included. The underlying idea of having TUG certified courses world-wide is strongly endorsed.

1 Why?

It has been on my desk for so long and I could not come to make my ideas more explicit than the oral comments given in Karlsruhe. This can be explained partly from the fact that I disagree with the TEXnically driven approach for the LATEX courses. Moreover, I consider it worthwhile to provide TEX courses also from the demand driven viewpoint. Therefore I was hesitant and in doubt about the effect in comparison to the invested energy. But we are TEXies are not we, and therefore we do what we think is useful and don't worry about the human costs but are led by the beneficial effect of exchanging ideas, building upon each other, and sharing the outcome!

2 Classification

2.1 Endorsement

Agreed the tests are clear and simple to apply within the TEX field, i.e., neglecting other experience. Happily, the answers are also published, seen [3].

2.2 But . . .

I have some problems with the classification from the point of view as coursetaker. What do beginner, intermediate and advanced really mean? I don't overlook that a tool is provided to give the answer for every particular case. The point I like to stress is that beginner etc. do not account for general computer science experience. I mean, taking myself as a beginner — in any CS related field — is different from a young enthousiastic personnel member, who likes to know what (La)TEX is about. This theme is elaborated below.

Let me make this clear by personalizing this. I don't know whether I'm a beginning TEXie, intermediate or, well . . . certainly not advanced. From the other way round I know: I don't consider myself as advanced, therefore I have to choose between beginner and intermediate. Honestly speaking I'm a beginner, because I partly read the TEXbook, understood part of what I read, and remembered hardly nothing, and well . . . , the test set I could make with 75% correct, I hope. But in programming (at least the principles of), in mathematics, in electronic publishing, making publications, handling SGML, to name but a few, I'm not a beginner, although for the precise coding I have to look at manuals, because I'm confused by the variations and have given up to remember the details of ALGOL60, PASCAL,

[1] This note is a contribution to the discussion guarded by Bart Childs, see TUGboat and/or the Karlsruhe EuroTEX89 proceedings.

ALGOL68, ADA, FORTRAN, BASIC, C and even dawning WEB, apart from OS details of VMS, NOS/VE, UNIX, MS-DOS, ... And then there are other packages and the huge (numerical) libraries ...

Is it not true that 'beginners' are invariantly burdened with things they already know from general experience? Therefore, I estimate this classification will entail a nonhomogeneous audience, with its pedagogical difficulties. These difficulties can be lessened by an individual approach in the 'laboratory' part, but then a superset of exercises have to be provided where the student can choose from.

2.3 Classification pragmatics

Let us adopt the given scheme for TEX, but let us adopt for LATEX a demand driven approach. By the way the metafont announcement did sound demand driven: design logos and font design! This approach for LATEX is endorsed by the experience gained in other fields as well: driving cars, using washing machines, radio, TV etc. People make use of it without understanding it except possibly for the principles. They are not burdened with the TEXnicalities why it works. If 'AS IS' does not work any longer a TEXnician is called. See, a.o., also Kubek's TEX for the wordprocessor operator, presented at Stanford. Moreover, learning to drive a car is not done by a mecanicien but an instructor.

3 Pedagogical principles

I missed the mentioning of pedagogical principles used. Not only *WHAT* is taught is important but also *HOW*! Especially, if we strive after worldwide TUG courses, given by various teachers, it is important to *teach the teacher*, not only with respect to TEX but the more so with how to teach. Train them in the pedagogical principles to be used. I mentioned in Karlsruhe that in nonregular education, I'm also involved with, this is done for a hundred or so free-lance teachers who are trained in this spirit. They are supported with recognizable courseware, such that like a book, anybody can smell from a rather remote distance that this course is from company so and so, without paying attention to the contents, just from form principles. This holds for the same courses given at different places by different teachers as well as for related courses. You undoubtedly are aware of the Gagné principles, which try to break with just listening or hands-on or both, but also pay attention to rehearsing, removing blockades, clearifying techniques and the like.

4 Courseware

The homogenity of the same course given at different places by different teachers will strongly benefit from unifying supporting courseware. The test set is the first step in this direction. The next step concerns the courseware. For courseware we need syllabi as hand-outs, related transparencies, sets of exercises and answers. For exercises I would recommend a superset where the teacher and especially the student can choose from, given their background and interest. Also an 'open' exercise, the problem the 'students' are working on at home, is allowed. These aspects, although sound for themselves, also alleviate the process in a nonhomogeneous class.

The development of the courseware could be organised as well. Either centrally organised and subsidised by TUG or via examples/pilots based on the specs which are in discussion now, and controlled by let us say TUG once again. The development of courseware is an order of magnitude more laborous then translating developed (English) courseware into other languages.

5 LATEX proposal

Invariantly I ask myself the question for whom I'm teaching and what is the (teaching) goal. The first is important because it makes clear *where to start*, in other words what is already known. This sounds

trivial but of what I have seen, this is generally not adhered to. From highschool to university it is invariantly neglected in the Netherlands. The teachers don't start in the 'language', or from the situation, the students are familiar with. With our LATEX course I aimed at report writing for scientists, i.e., the coursetakers should be able after the course to make a report which contains ordinary text, formulas, illustrations and some tabular matter all embedded in the general report structure, with title matter, foreword, table of contents, chapter, (sub . . .)section, paragraph structure, appendices and end matter such as index, glossary, references and the like, embellished with exceptions like end/footnotes, margin remarks and cross-referencing. Assumed experience: can handle an editor, access a LATEX computer, can make some publication. Moreover it is assumed that the contents of the publication is understood.

After having stated the aim I try to abstract from the tool (LATEX in this case). The exercises were brought together independent from the limitations of LATEX and prompted by practical needs, well . . . , that is what I urged my co-authors to do. The consequence of this is that emphasize is put on *WHAT* to accomplish – demand driven — and less on *HOW TO* — technique driven. This makes it also useful in other contexts. It is hopefully abundant to say that in a course (Report)Publishing with LATEX the 'HOW TO' must be explained in the chapter preceding the exercises. The answers are of course within the context of the tool.[2] Note the charming side effect of this approach: exercises which cannot be handled easily, or not at all, are allowed. In our interface examples of usage of FORTRAN libraries in HLP's, some examples are worked out with the comment: Sorry, using FORTRAN routines with a procedure as parameter are not possible from PASCAL. Thís elaboration is time (place or manufactury) dependent, while the set of examples, judiciously chosen, suffer much less from 'wearance'.

Personnel vs. scientists

This paragraph is not aimed at polarisation between personnel and scientists. For personnel the same exercises could be given, i.e., the same results are wanted.
More attention must be paid to the way of working, i.e.,

- 1^e personnel are used to the WYSIWYG method of working (so a sun-like configuration is wanted, or provide a user interface they are familiar with (e.g., Anita H's WP interface)),
- 2^e personnel do not necessarily understand the contents, and
- 3^e personnel are doing this kind of work most of the day.

At the moment, what we call, β-scientists, are familiar with programming and therefore with the command approach, but most of all they know where the publication is about and understand every detail. This different attitude must be accounted for.

5.1 Demand driven

With the above approach it is easier to adapt EP courses to say SGML, (Report) Publishing with SGML, or how to achieve Publishing with TEX, or even WP. This approach also allows to use different techniques with the same printed result, e.g., a form can be obtained via the tabular and picture environment. At our University I invariantly shake my head about LATEX and WordPerfect classes differing so much in approach and courseware, and that the teachers hardly communicate. Even the next WP teacher complete disagrees with his predecessor and develops once again courseware, generally ingeniously motivated. This demand vs. technique driven approach also emerged in the/my teaching of programming languages, where the principles of programming are kept in paradigms and a certain discipline, while the coding is determined by — here and now — suitable compilers.

[2] Within the context of numerical mathematics this principle led to practice on any computer familiar to the students; no restriction to VMS, UNIX, NOS or whatever.

5.2 (LATEX) courses

From the practical point of view I will restrict myself for the moment to a set of LATEX courses, but such that we could substitute SGML, TEX, Wordperfect, . . . , for LATEX and still have a practical set.

- LATEX an introduction, or beginning LATEX.
  One day introduction. An overview what it is all about, where to get, hardware requirements, how to get macros, information sources (TUGboat, TEXHaX, . . .), how it is supported (use of listservers: TEXHaX, and national listservers), estimated lifetime, ease of learning, survey of courses which can be taken, documentation, relation to alternatives.
  Scheme:
  2 hours introduction (general aspects) and letter as example,
  coffee break
  1 hour hands-on: personalizing letter template
  lunch
  1 hour article introduction
  2 hours letter hands-on (personalizing template).
  Result: as appetizer a letter and article are produced starting from templates, so the class will have something to take home, and not only have heard about the quality but also experienced it.
  Prerequisite: some (Personal) computer experience.
- LATEX Wordperfect user interface.
  One day. How to use Anita H's macros. (This course is site dependent. At our site Wordperfect is the standard wordprocessor for the moment.)
  The knowledge of the introductory course is assumed.
  Prerequisite: experience with document structures, using a wordprocessor, using computers, using fileserver(s).
- Publishing with LATEX.
  Five days. Only one style (report) is dealt with 'AS IS'.
  Scheme:
  Every morning theory and every afternoon laboratory work.
  1^{st} day: introduction and ordinary text (structure, local exceptions: end/footnotes, margin remarks),
  2^{nd} day: mathematics,
  3^{rd} day: tabular matter,
  4^{th} day: graphics, and fonts,
  5^{th} day: integration (toc, references, index, headers/footers, title matter, . . .).
  Result: a report and experience how to make details of it. The knowledge of the introductory course is assumed.
  Prerequisite: experience with writing a report, handling an editor, using computers, using fileserver(s).
  Note. The $2^{nd}, 3^{rd}, 4^{th}$ day can be interchanged or deleted dependent on the circumstances, a modular approach.
- More Publishing with LATEX.
  Three days. More a workshop. Advanced LATEX tools which have been developped by the community.
  (Drop macro, bridge, chess, changebars, endnotes, tables over several pages, more column formats, bezier style, trspar style, . . .)
- Modification of sty-files.
  Three days. Given a GENERIC sty-file the various modifications are explained and instantiated. The exercises build up to instantiation of a specific `journal.sty`.
  The experience gained in the Publishing with LATEX and intermediate TEX courses are assumed.
  Prerequisite: experience with writing a report, handling an editor, using computers, using fileserver(s).

Note. No scheme is provided as of yet. Even the precise number of days is not fixed.

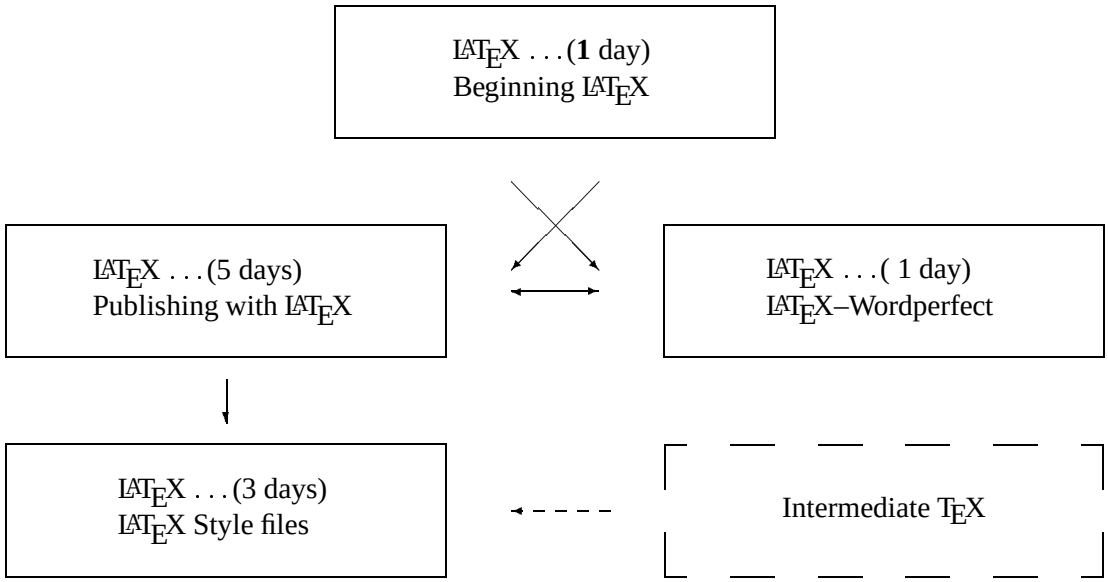
Remark. Courseware to start from is available for:
Beginning LATEX: Letter and article templates, RC-RUG report 27.
Publishing with LATEX: Publiceren met LATEX. CWI-syllabus 19.
LATEX style files: Journal.sty guidelines, RC-RUG report 26; or, Documentstijlontwikkeling. TEXnique. Utrecht.

5.3 (self)Test set

No test set is included. If the approach is adopted, I would also like to contribute to the test set.

5.4 Dependence

For advanced LATEX style course the TEX intermediate course must also be a requirement. I missed this interrelationship in the course scheme, [2]. In the scheme below the More Publishing with LATEX course is not displayed. Perhaps it could best be sketched in the third direction.



Conclusion

It is hoped that this paper will contribute to an international agreed upon set of TEX and LATEX courses.

References

[1] Bruin, R. de, C.G. van der Laan, J.R. Luyten, H.F. Vogt(1988): Publiceren met LATEX. CWI-syllabus 19. Centrum voor wiskunde en informatica. Amsterdam.

[2] Childs, B. (1989): Teaching TEX. TUGboat, 10#2, 156–163.

[3] Childs, B. (1989): Answers to TEX tests. TUGboat, 10#3, 319–323.

[4] Doob, M. (1989): A gentle introduction to TEX. A manual for selfstudy. (Also as RC-RUG rapport 25).

[5] Laan, C.G. van der, J.R. Luyten (1989): Letter and article templates. RC-RUG report 27.

[6] Poppelier, N. (1989): Documentstijlontwikkeling. TEXnique. Utrecht.

[7] Steemers, L., C.G. van der Laan (1989): Journal Style Guidelines. RC-RUG report 26.