Working Group 1: Education
Contribution to TUG LRP report[1]

Reactions from: Malcolm Clark, and Don Hosek

Kees van der Laan

1 Educational issues

The starting point for the future is
- professionalism and
- selfcontainedness (selfsupporting).

The latter means that education should not have the function of a money-making nor money-costing activity. Because of the importance of education it is desirable to create a TUG education committee to guard, stimulate and organize events. With respect to education the following issues are relevant

1. courses (and courseware)
2. workshops
3. self-teaching materials.

Furthermore, it must be kept in mind that, like TeX, educational issues can profit from a worldwide approach.

1.1 Courses

With respect to courses we have to deal with
1. pricing policy
2. pool of teachers of sufficient quality
3. description of course modules and the interrelations
4. courseware to assist teachers
5. organizational aspects

1.1.1 Pricing policy

It is practical to have a uniform pricing policy: let us say a day of a course will cost $200,-, based upon 7 students, labwork, courseware, teacher's salary, hiring room and equipment, and refreshments. The price implies that with less than 7 sign-ups a course will be cancelled unless it serves a strategic goal. The education committee has to decide upon the course to be held, explicitly and in due time, such that potential coursetakers can be notified of cancellation. For non-T/LUG members the fee is to be augmented with 25%. The costs can go down if the course is arranged locally, where for example no rent of equipment is necesarry or teachers are available at low or no costs. Further strategic discounts can be given at the discretion of the educational committee in agreement with the treasurer.

1.1.2 Teacher's pool

Teachers themselves have to pass some examinations to proof their TeXnical knowledge and educational skills. This issue has to be dealt with the educational committee. Of course experienced teachers are freed from this process at discretion of the educational committee. One category is formed by those who as part of their education, are already qualified teachers; it remains however that TeXnical knowledge has to be ascertained. For the intermediate term a list of experienced TUG teachers have to be maintained.

1.1.3 Course descriptions

A sufficient subset from (past) TUG teachers (Malcolm Clark, Lincoln Durst, Victor Eijkhout, Doug Henderson, Amy Hendrickson, Don Hosek, Nico Poppelier, Chris Rowley, David Salomon, Joachim Schrod, Philip Taylor, . . .), has to be asked to complete the work of Bart Childs: Teaching TeX, TUGboat 10#2, 156-163, and some reactions to that. That is to say: provide description of course modules and their relation, especially for

P Publishing (???)

T1 beginning TeX (demand driven, 3 days),

T2 intermediate TeX (TeXnical driven, 3 days),

T3 advanced TeX (TeXnical driven, 5 days),

L1 using LaTeX (demand driven, 3 days)

L2 modifying LaTeX styles(TeXnical driven, 1 day),

M1 logo design (demand driven, 3 days),

M2 font design (TeXnical driven, 5 days),

W1 WEB programming (TeXnical driven, 3 days).

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[1] The start of a discussion on the Education issues. No conclusions of yet. No reaction of Doug Henderson has been received nor a message that he has received the material.

Apart from the above standard courses, special courses like SGML, typography or TEX capita, for example TEXing math for typists, can be considered. Most important of all is to get the basics straight. Get it international. Good announcements with descriptions, prerequisites, teacher name and what has been —or will be— learned items. The problem of inhomogeneous classes is not solved but hopefully lessened because of better description of prerequisites and interrelations with other modules.

1.1.4   Courseware

Courseware should be made available in the TEXniques series. By the way this series should have a uniform appearance. The TEXniques editorial team should look for copy, have it refereed, processed etc. Apart from these hand-outs, transparencies are needed. Materials to create and maintain the transparencies are needed as well. A seal, a logo, should be on all materials. By the way the appearance of the material should be such that it is easy recognizable as well.

1.1.5   Organization

For TUG courses an educational committee has to be formed. The task of this committee is to plan the courses, do the advertising, organize the courses, and finish it all up. The TUG office should assist the committee by handling all logistics, do the registration, send out confirmations, prepare certifications, and take care of financial matters.

1.2   Workshops

This very useful educational form is cheap and suitable for exchanging knowledge and experience. It supports the decentralization and is suited for LUGs.[1] TUG tradionally organized workshops along the annual TUG meetings. ukTEXug has a workshop schedule for each year. It should be stimulated! It is a small-scale cost-effective educational form.

1.3   Self-teaching materials

The educational committee should watch out for suitable tutorials, and stimulate authors to develop some. The suitability of the TUG video tapes is unclear, and has to be addressed, again by the education committee.

2   Some comments on 'Educational issues' (Malcolm Clark)

2.1   Preamble

Unfortunately I was not able to be present at the meetings of the education committee.[2] Although it seems rather reactionary, I would like to go through some of Kees' points as presented in his version 0 report of August 1991.

2.2   Starting Point

I can have no issue with the need for professionalism. But we have to come to terms with the notion that we are a vocational group, not a professional one. We may comprise many professionals, but no-one requires membership of the group as a prerequisite for professional advancement.

I am however unclear how the selfcontainedness/ selfsupporting aspect can be handled. At present a significant portion of TUG's income is generated through courses. Agreed, courses may only be one part of a generalised educational programme. I do not believe that the education committee should make this decision, which has clear implications to the organisation as a whole. To effect a balance between money-making and money-costing is not likely to be easy, unless we are talking over a time period of years. I personally see no reason to expect courses to fail to generate some income for TUG. There is clearly no need for courses to appear to be exploitive but we should not strive officiously to break even, and we should expect some return. Individual courses may have to be run in order to create a progressive structure of education, regardless of whether they are initially 'profitable'. I think we can acknowledge that 'profit' is not simply financial, nor immediate. At the present however, we cannot afford to run courses which do not at the minimum break even.

2.3   Pricing

The pricing policy is very dependent on the overheads. Note that no allowance is made here for the office overhead, or of the costs of advertising in TUGboat (I'm talking of the real costs rather than costs to an advertiser). Similarly any mailing costs incurred by TUG must be included. I am relieved to note that there is a strategic consideration included. Within the general outline though, it is unlikely that courses are run by fiat of the education committee. Courses are run in part because there are local organisers who are willing to do the legwork. The location of such organisers is likely to be rather random.

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[1] Any gathering of TEXies can accomplish this! At Dedham Oregon 'workshops' were rumoured.
[2] Note Kees. What committee? As far as I know NTG's education committee never met.

2.4   Fees

Course fees have to be at a level which is plausible. If courses are cheap they may not be taken seriously. A 'normal' cost for courses in the UK is around £175–250 per day (perhaps reducing for 5 days). Provided the 'professionalism' mentioned before is attained, this is a reasonable sum. Criticism comes when we do not provide good computing equipment, or an obviously prepared course. Even if we reduce course fees because we are unsure about these items, we will still get a bad press. The most important cost to the students is time. Wasting a week of someone's time will get a very bad press. Much worse than apparently costing £250 per day.

Whether non-T/LUG members have an augmented fee, or T/TUG members have a reduced fee is unimportant. The important item is that there is a differential. Thus some aspects of education are again a benefit of membership.

2.5   Pool

I am uneasy at the 'teacher's pool'. While accepting the need for profesionalism, I am very unclear how this would be set up. I think my unease stems principally from the fear that this kind of structure may become self perpetuating and may generate a set of rather unexciting teachers. Maybe I am pessimistic. In some respects I would be happier to have potential teachers work as teaching assistants and assessed in this way. Even then I am unsure.

2.6   Course descriptions

Are these the right categories? It seems to me that an important component of most of the early courses is the availability of hand's on experience. We can follow courses intellectually but may find it difficult to apply in a practical situation. Are there different courses for different groups? I find an 'inhomegeneous' group very demanding, but not intolerable. If there is a choice between an inhomogeneous group and two more homogeneous groups which are sufficiently small that the courses do not run. . . I confess that I do not favour the course descriptions outlined in 10#2. I find them constraining and limiting. Nor do they develop in what I regard as a logical and structured manner.

How should courses relate to one another? I do not believe they must dovetail into one another. We should not encourage students to take successive courses except in very exceptional circumstances. Time taken between courses, where the student has the opportunity to use the information, is essential. This blurs the subjects which are to be taught at each 'level'. In using TEX the student learns some new things, uses the book, hacks other people's code, and so on. The next level course may need to cover some earlier material, but equally

must be sufficiently flexible to encompass some of the specialised demands of the students (but not entirely – there are some core things which may have to be taught). Maybe that's what I'm getting to eventually: rather than a detailed course outline, a core syllabus.

2.7   Courseware

Courseware may make us too inflexible. While it may be useful to have some prepared courseware I have always found that it is better to prepare my own course notes. At least it ensures I know what is there and how to use it. More important, it ensures I know the whole structure of my course. I have no argument with producing specialised material in the TEXniques series. But at best it can only be supplementary. It may be provided for a course, but should not be used for a course (except by whoever wrote it).

2.8   Organization

Yes, but this is fine for the US (possibly), but it needs to be backed up in other ways if it is to provide a model for non-US courses. The delays introduced may make the course unworkable.

2.9   Workshops

The ukTEXug runs workshops, and in general we have found them to be useful, since they enable the participants to bring up issues which are of importance to them. Whoever leads a workshop really does have to be on top of their material. But the reason we run workshops rather than courses is because they can be scheduled for a single day, and therefore place less burden on us in organisational terms; and they can be targetted for more people – therefore being of use to a larger proportion of our membership. We are conscious that longer, more traditional courses are probably required.

2.10   Self-teaching

Any material will be useful here. Let's be honest, most TEXies and LATEXies are self taught. And will continue to be.

2.11   Postamble

This is intended more to provide a basis for a contrary view, rather than a direct criticism of Kees' proposals. It is always far easier to pick on structured proposals than to create one's own.

3 Clarifications to Malcolm's reactions (Kees van der Laan)

Firts of all. Thanks Malcolm for contributing to the discussion. This might be the start for educational issues getting more attention.

3.1 Professionalism vs. vocationalism

Malcolm first makes the distinction between a professional and vocational group, with TUG being the latter. Whether this is true or not does not matter. Whatever group we are, we should conduct business professionally —with organizing and teaching courses as one of the activities.

3.2 Selfsupporting and selfcontainedness

The next point he addresses is selfcontainedness. He is completely right that in TUG's past and (some?) time to come, profitable courses formed a cornerstone for TUG's budget, at least profit was made on it. My point is: it should not be. It should be a cornerstone of TUG's investment policy in 'people.' The way to do this is strive after 'break-even'-ness, with coursetakers, who benefit most, to pay for all the costs involved. Eventually, courses can be strategically subsidized as part of a long-range plan.

3.3 Education committee, or who is responsible?

Because of the image and money involved it should be clear that the Executive Committee and indirectly the BoD, is responsible and make the decisions.[3] Or it should be delegated to the office with a liason in charge. There are a lot of decisions to be taken:

- What courses? When? Interrelation?
- Budget issues (What is the salary of the teacher? What are the costs? What are the fees?. . .)
- Who are the teachers? (Pedagogical and TeXnical qualifications? Who judges?)
- Courseware?
- Other educational activities? Workshops? TUG-sealed decentralized courses?
- Advertisement policy?
- Which courses should be cancelled under what conditions?
- What does TUG-sealed mean anyways?

My point is that education is a too important issue to be left alone. With realistic budgeting, incalculating all costs, fees can be kept 25% –50% below the plausible level, in my opinion. What I heard at meetings was always about the difficulty to raise money to attend a

meeting not to speak about the difficulty in raising the money to attend a course.

> I heard of teachers being able to attend a meeting thanks to the salary earned at teaching.

Much TeX work is not yet respectible, not part of the standard tools in contrast with Wordperfect, THE STANDARD, at least in the Netherlands. Therefore not many employers are willing to pay the (TeX) costs for their employees. This makes attending a meeting a private enterprise, to be combined with holidays or worse sacrificing holidays. The people able to attend courses have the time issues left to talk about; those not able to attend are not asked why, simply because they are not present.

3.4 Teacher's pool

The point I'm trying to make is that there are already teachers around, —so there is a pool already, T/LUG-oriented though— but we need a solid qualification process. Some names.
DANTE: Wolfgang Appelt, Helmut Kopka, Joachim Lamarsch, Joachim Schrod, Norbert Schwarz, . . .
GUTenberg: Yannis Haralambous, Raymond Seroul, . . .
NTG: Victor Eijkhout, Theo Jurriens, Kees van der Laan, Nico Poppelier, Piet Tutelaers, . . .
TUG: Doug Henderson, Amy Hendrickson, Alan Hoenig, Don Hosek, David Salomon, Richard Southall, . . .
ukTeXug: Malcolm Clark, Chris Rowley, Philip Taylor, . . .
etc.[4]
I'm only arguing that it should be a good policy to have official TUG-qualified teachers. We have a bootstrap problem here. Malcolm's process via teaching assistants is too close to 'old-boyism,' or incrowdness, too restrictive and not sufficient. Having served as teaching assistant should be part of the qualification process, however. By the way I did not work out in my note what should be part of the various modules to be taught nor what should comprise the requirements for qualification.

3.5 Course description

Not only an aid for teachers, but more importantly for the aspirant coursetakers: it should be clear what will be taught and to what detailed/advanced level. Of course, hands-on experience should be part of courses, especially the introductory ones. The homogenity of a group is indeed demanding, . . . and tolerable. But, that should be the exception rather than the rule. In my opinion we should have fair descriptions of the standard courses: introduction, intermediate and advanced TeX. Getting

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[3] At the moment responsablity for TUG course issues is delegated to the TUG office.
[4] I'm not aware of the undoubtedly good teachers in Japan, Russia, Czechoslowakia, Hungary, . . .

started LaTeX, modifying LaTeX style files. And their interrelations. Dovetailing might be too strong, but it must be made clear what is the difference between intermediate and advanced. In order to profit most from the modifying LaTeX styles course, it must be clear for example that intermediate TeX is a pre-requisite. If not the teacher is in trouble. For Metafont something like logo design and font design might be thought of. Next to the above there should be room for capita selecta. The latter can be treated differently from an organizational viewpoint, because of the reputation of the teacher. By the way making the teachers known along with the course announcements is good practice, and might increase the confidence of the subscribers.

3.6 Courseware

I really can't see why we should not strive after high-quality courseware, to be made available in the TeXniques series for example.[5] Note that courseware should contain exercise sets and answer sets as well. It might also help to have sets of transparencies available for the standard courses. (Of course teachers might elaborate on these and add to or improve.) All these to guarantee a minimum quality and continuity of courseware.[6] It makes it much easier to have the exercise sets (and answers) separately available, not spread in between the theoretical material. The guaranteed quality of the courseware might also constitute an issue in the advertisements:

> TUG-sealed, qualified teachers using so and so pedagogical principles, and TUG qualified courseware.

There is nothing against self-teaching, except for the time it takes and the lack of feedback, as well as the difficulty in getting insights in the issues spread all over the TeX, LaTeX, or Metafont book. The availability of high-quality courseware might strengthen the internationality of TeX and related tools.

4 TeX and LaTeX education by T/LUG(s) (Don Hosek)

Reading the correspondance between Kees and Malcolm which was forwarded to me on 17 September, I have the following notes.

4.1 Pricing policy

As Malcolm points out, the issue is less one of providing fiscally inexpensive courses so much as providing courses that don't take up a great deal of time. The LaTeX courses which I have taught have, with few exceptions, been largely to clerical staff. There are few offices willing to give up their secretary for a full week which presents a practical problem. On the other hand, short term classes where travel is involved can also be difficult to arrange: A one day or two day class is typically only practical in terms of additional costs to the consumer if it is fairly local. This limits the potential locations for a class since it calls for a relatively high local concentration of potential students. To show a profit, the instructor should generally be local as well. This brings us to the second section.

4.1.1 Teacher's pool

There are fewer qualified teachers than may be apparent at a first glance at the listings in Kees' note. Only 6 of 11 are in North America, with two in New England (both plain TeX), one in rural Illinois (I imagine Victor also teaches plain), two in So Cal (one plain, one LaTeX) and one in the Northwest (MF). The distribution of teachers is almost a mirror image of the distribution of classes. TUG has yet to offer an open LaTeX class west of Chicago (there were two in-house classes offered, one in St. Louis and one in Boulder, CO which are the only ones on this side of the Mississipi). If nothing else, this shows dramatically that there could be room for increasing the pool of teachers. Certification of some sort, however, is a must. I personally like the idea of having the potential instructor TA a class before teaching. I personally had never attended a TeX class before teaching my first (and the first and only experience I had seeing another teacher's style was in College Station when I sat in the back of Malcolm's class and listened to the interesting bits of his class on Graphics in TeX between chapters of Moby Dick. This however does not preclude the need for a genuine certification process. Knowing how to get indentation after a section heading of LaTeX does not make one a good LaTeX teacher. (Incidentally, it was rather painful to look at Kees' "LaTeX" code with its insidious \\-s which didn't belong to the structure, not to mention the incorrect use of

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\section* for
\section + \setcounter{secnumdepth}{0}.
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4.2 Description of course modules

Trust me. Four days is a minimum for teaching basic LaTeX and that's still a bit tough. The first day is devoted largely to familiarizing students to the equipment and ideology of LaTeX. It's a bit of a jump going from a typewriter to structured markup. As for modifying LaTeX styles in a day, it's difficult to imagine how much of use is going to get covered in that day (I filled five

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[5] At the Paris91 Education BoF it was mentioned among others to have standardized exercise sets available.

[6] At Stanford89 I taught a one-day SGML class. No hands-on and no exercise sets! Notes did probably not obey the style for notes.

days with little effort and still didn't cover everything that was necessary).

Teaching font design in five days is a dream. Students can learn to use the tools of MF in 2 or 3 days and create pleasant dingbats or logos with that knowledge, but lettering takes considerably more training (once upon a time, I posted an outline of what was necessary to learn lettering: it involved beginning with learning calligraphy and developing a feel for how the pen shaped the letter, studying classical inscriptional lettering styles and understanding their forms, learning to draw characters with pen and paper and THEN they could start playing with MF or Ikarus or somesuch. TUG really is not equipped to teach font design with MF (the only situation that I would feel reasonably confident about teaching such a class would be Richard Southall or Neenie Billawalla teaching the class as an optional component of a curriculum in type design).

I have no idea what demand driven vs. TEXnical driven means.

In Bart's charts, he has students moving directly from Intermediate LATEX to style files. Not a chance. A more reasonable approach would be Advanced TEX + (ideologically correct) LATEX. Without an understanding of and sympathy for the design philosophy of LATEX, any

style file is going to be a piece of ____. I have seen many of these.

Incidentally, on the topic of ideologically correct LATEX, the only published LATEX book that I have seen that meets this requirement is Leslie Lamport's although he has many poor choices of examples in the text. David Buerger's book keeps the other books on the shelf from leaning too much and the 'LATEX for Everyone' published by Personal TEX is marginally better but still unsuitable. My LATEX book is still unfinished (although I am willing to send paper copy to people on the condition that they are willing to critique the texts for me).

4.2.1   Courseware

I've taught courses with material I've developed myself and with other people's material. The latter is seldom an aid to teaching. However, a detailed outline is useful and I've prepared one such outline in conjunction with my LATEX classes. It's somewhat dated at the moment, but I intend to make a revision soon. To get some idea of what I feel a good instructor's outline would look like, I include the first unit in the figure.

Any transparency material should include a detailed explanation of the significance of the slide.

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|I.    Basics of LaTeX
|I.1.  What is LaTeX?
|How does LaTeX differ from visually-oriented systems? Why is it
|better? Explain how in LaTeX one describes what things _are_
|rather than how they _appear._ An overview of the LaTeX process
|(LaTeX, DVI-to-XXX, print).
|
|I.2.  LaTeX input conventions
|The minimum set of commands for a LaTeX document:
|\documentstyle, \begin{document} and \verb+\end{document} How
|LaTeX treats spaces. Paragraphing. Quotes and dashes. Special
|characters ($, %, _, etc.). Case matters!
|
|I.3.  Special spacing considerations
|Explain using ~ to get unbreakable spaces; \ and \@ to fix cases
|where LaTeX puts end-of-sentence space where it shouldn't or
|doesn't where it should.
|
|I.4.  Printing a title
|Simple \title and \author (single-author) commands. Noting the
|fact that arguments to commands go in braces. Don't introduce
|line breaks or \and yet; these are confusing at an early stage.
|Point out that the title is only printed if \maketitle is
|present and that it must come after \begin{document}.
|
|I.5.  Printing section headers
|\section through \subparagraph. Leave out \chapter for now since
|we're only doing articles. Also don't teach *-forms. In fact,
|*-forms are left out of the class since they are not of any
|direct use to the user.
|
|I.6.  Extracts
|Introduce the concept of environments; demonstrate the use of
|the verse, quotation, and quote environments. Examples of quote
|should emphasize the fact that it should be used for short
|quotations (single paragraph, often single line) as opposed to
|quotation which is used for longer quotations where the initial
|paragraph indentation is necessary. Be sure that users understand
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|that a blank line after the \end command indicates that the
|paragraph has ended and will control whether indentation of the
|following paragraph takes place. A similar logical function is
|assigned to the blank line preceding the environment. All
|examples should reflect this (i.e., PUT THEM IN CONTEXT!).
|
|I.7.  Basic math
|Introduce math through the math, displaymath, and equation
|environments. \(...\), $...$ and \[...\] are introduced after
|the corresponding environments since Formulae should be
|restricted to those which can be typed with the characters on
|the keyboard. Note that ' and := do the things that we had hoped
|they would do. Point out to any plain TeX people that $$...$$
|should not be used in LaTeX.
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Figure 1: Hosek's Example outline

5   Comments (David Salomon)

Kees,

I just received your latest memo on education.

I fully agree with the folowing:

1. Classes should be self supporting and hopefully, but
   not necessarily, a source of income for TUG. This
   means that after running a large (introductory) class
   and making a profit, TUG should be willing to use
   it to run a small (advanced) class and lose money.
2. Future instructors should demonstrate their
   TeXknowledge (by passing an exam) and document
   their teaching ability (by providing a resume or let-
   ters of reference). The TUG education committee
   should be in charge of selecting instructors.
3. Instructors' fees should be flat and not depend on
   the class or the number of students.
4. Instructors should be encouraged to publish their
   class notes in TeXniques, or to use somebody else's
   published notes.

I don't like the idea of 3-day introductory and interme-
diate classes. I know from long experience that 5 days
are minimum.

A general comment: The more advanced a class, the
less lab time it needs. Thus the introductory class
should be at least 50% lab, but something like output
routines can run without a lab at all.

6   Afterthoughts (Kees van der Laan)

The more I come to think of it the more I'm convinced
that we definitely need a basic course about publishing
independently from the typesetting tool. One could
think of teaching the Chicago manual of style. I al-
ready adopted this approach when dealing with math;
starting from Math Typesetting tradition as detailed in
Swanson's book, followed by the mark up of realis-
tic examples taken from math literature. One could
also think of a workshop-like approach similar to the
one about Mathematical Writing, as reported by D.E.
Knuth, Tracy Larrabee, and Paul M. Roberts, MAA
Notes 14. During the process of collecting material for

discussion I adapted the original version with respect
to: misuse of English, typos, trivially overlooked de-
tails, with the consequence that some comments are not
quite to the issue. For example while writing this after-
thought I decided to include the basic module P about
Publishing. The commentors have not been in th posi-
tion to comment on that. Not correct, but the purpose
of getting the discussion off the ground is served by it,
and it might facilitate the creation of some sort of report.