Introducing Students to LaTeX for Writing Their Thesis/Dissertation

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Abstract The old adage, "You can lead a horse to water, but you can't make it drink," applies when trying to convince students to change to LaTeX for writing their thesis or dissertation. Students like to stay in their "comfort" zone and do not look favorably toward the work of learning a new software system. To date I have convinced one professor and two students to use LaTeX as their primary document formatting system.

1   Introduction

I was introduced to LaTeX by Dr. Pan at the University of Texas at El Paso in my first semester of graduate school in 2003. I had asked to see his dissertation, and as soon as I saw the equations I knew I had to have that software because I knew I could never get that quality using MS Word®[1]. I was an easy convert.

The great-looking equations is one of the selling points I use when I give my seminar on "Using LaTeX for Writing Your Thesis/Dissertation"; http://www.keithljelp.com/LaTeX/MainLatexClass.pdf. The class is scheduled for two hours with the last twenty to thirty minutes reserved for a free form discussion on topics requested by the audience. The audience consisted mostly of masters students and a few Ph.D's. The people who show up are at least interested in learning about LaTeX.

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1. Registered trademark of Microsoft Corp.

2 Discussing The Advantages and Disadvantages of LaTeX

As the attendees are arriving I tell them about the CDs by the sign-in sheet that has the TTU style file and a source/template file that they can load onto their computers. I had sent an E-mail to all the people that had registered for the class a few days before suggesting that they bring their laptops.

After I have introduced myself I tell the audience that the presentation was created using the Beamer class; http://latex-beamer.sourceforge.net/, in LaTeX, and then I point out some of the advantages and disadvantages of using LaTeX to write their thesis/dissertation and beamer to create presentations:

1. It's *free*;

2. It has many professional-looking qualities, such as the headings and sub-headings;

3. LaTeX has a long learning curve but the results are worth the effort;

4. It has many useful features, such as an outline Table of Contents on the right of the Beamer slide;

5. By clicking on a entry in the Table of Contents the presentation goes to that slide;

6. The great-looking equations;

7. Automatic numbering of equations and sections;

8. ... and many more.

Why Am I Here?. . .

- **Why Switch?** You Know MSWord and it is "WYSIWYG".
- **Learn a new application?** Why Should I spend some of my "Copious Free Time" to Learn New Software.
- **Look at those Equations!!!**

$$\chi^2 = \frac{\left(\sum_{i=1}^{N}(x_i - \bar{x})^2\right)}{\bar{x}} \qquad (1)$$
$$= ID(N-1)$$

- LaTeX, "Way Cool", Let it do the work for you.
- LaTeX, IT'S FREE

Introduction to LaTeX

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What is LaTeX?
Introduction
History

Installation
PC
iMac™

Using LaTeX
Internet Resources
Text Editors
Recommended
Reference Books
Dissertation files
LaTeX Documents
Bibliography
Table Creation
Chapters
Writing Equations
Lists
Finished Document

Summary

Figure 1: LaTeX Advantages

At this point in the presentation I discuss the history of LaTeX and why LaTeX is different from other word processing systems. I stress that LaTeX allows the author to concentrate on the content and not on layout. Now it is time to show the audience how to install a LaTeX system on their computer. I cover both PCs and Macs and after each computer type is discussed I ask if there are any questions on how the installation is performed. At this point in the presentations I begin to discuss some the resources that are available on the internet, tutorials [2], and the reference books I would recommend that all LaTeX users have in their library.

I am now getting to the meat of the class. I show a suggested directory structure to help them keep all the different parts organized. The third slide in this section is a seven-line source/template file to introduce the audience to what a basic LaTeX file consists of. I specifically use the word template since 20% of the audience are MS Word® users.

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2. The Indian TeX Users Group has an excellent set of Tutorials: http://www.tug.org.in/tutorials.html

3 Thesis/Dissertation

The "Thesis/Dissertation" section of the presentation consists of seven slides[3]. The first slide in the sequence shows the first part of the preamble. I talk about some of the packages that are available for use in a LaTeX document and how a basic source file can be used for not only their thesis or dissertation, but all their research and report papers as well.

Figure 2: Thesis/Dissertation Source

The second slide in the sequence is where I talk about how in the preamble they can create special commands to speed up the writing and at this point the body of the file starts. The third slide covers the title, author, committee members, Table of Contents, List of Figures, List of Tables, the and Dedication, and other front matter. The fourth and fifth slides are where I talk about how to organize

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3. The presentation is available for download at: http://www.keithljelp.com/, LaTeX Seminar

the various thesis/dissertation parts into separate directories on their computer, how to write each chapter of the thesis/dissertation as a separate document, and how to use the input command to include a chapter, appendix, etc. The sixth slide covers the bibliography.

Figure 3: Thesis/Dissertation: Bibliography

I spend a lot of time here and show them how to create a bibliography database file using BibTEX and I discuss some of the other software packages that can create the database for them by just filing in a form. I stress how this will same them hours of time and that this is where most students have problems getting their thesis/dissertation approved by the graduate school. The seventh slide covers the appendices.

The last four sections consist of how to create tables, chapters, the writing of equations, lists, and how to finish the document. I cover these five sections in about twenty minutes. When I am talking about tables I recommend that they

use Excel® [4]. I cover an add-in for Excel that will convert the selected part of a spreadsheet to a LaTeX tabular format. (This results in 90% of the table converted automatically, and the rest must be cleaned up manually. The add-in file is no longer available for download from the internet, but, I tell them to send me an E-mail and I will sent it to them.)

Just recently I have found a new table generating application available for Apple's OS X®[5] operating system: TeXTable at http://www.twistedtheorysoftware.com/, TeXTable has a spreadsheet like input and it is very easy to use. The latest version (0.2) allows import and export of CSV files so creating large tables from data is now a lot easer. I will be adding TeXTable to my presentation.

4   Conclusion

I enjoy teaching this seminar and spreading the "word" about LaTeX. The graduate school has requested that I repeat the class this spring.

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4. Registered trademark of the Microsoft Corp.
5. Registered trademark of the Apple Inc.