

On the Difficulty to Design Arabic E-learning System in Statistics

Taleb Ahmad

Wolfgang Härdle

Julius Mungo

CASE-Center for Applied Statistics and
Economics

Institut für Statistik and Ökonometrie
Humboldt-Universität zu Berlin



Motivation

- Effective education is a necessity.
- E-learning is an online education framework.
- Statistics is the field that can profit a lot from e-learning/e-teaching standards.
- Many websites provide students with attractive ways to learn statistics.



Figure 1: MM*STAT with the multiple languages

- E-learning market in Arab countries is smaller than Europe, United States market.
- We present a case study, which describes the development of the statistics e-learning-course in arabic.
- The implementation of MM*STAT needed for Arab educational institutions is however difficult.
- We propose a Wiki based solution.

Outline

1. Motivation ✓
2. E-learning/e-teaching MM*STAT
3. Statistics e-learning for arabic and the difficulties
4. WiKi technology implemented in arabic e-learning system
5. Conclusion

e-learning/e-teaching MM*STAT

- MM*Stat is an HTML based multimedia environment, see (<http://www.md-stat.com>).
- It provides e-learning of statistics in many languages.
- For a detailed description of MM*STAT see MRZ (2000).
- Multiple choice questions are provided for self-assessment and based on JavaScript.
- MM*STAT is a composition of filing cards.

http://www.quantlet.com - MM*STAT - Microsoft Internet Explorer

lecture 6.4 information 6.4 explained 6.4 enhanced 6.4 enhanced 6.4 interactive 6.4

6.4 Hypergeometric Distribution

The Hypergeometric distribution is based on a **random event** with the following characteristics:

- total number of elements is N
- from the N elements, M elements have the property $N-M$ elements do not have this property, i.e. only two **events**, A and \bar{A} are possible
- we randomly choose n elements out of the N

This means the **probability** $P(A)$ is not constant and the draws (events) are not independent in this sort of experiment.

The **random variable** X , which contains number of successes A after n repetitions of the experiment has a Hypergeometric distribution with parameters N, M , and n , with **probability density function**:

$$f_H(x; N, M, n) = \begin{cases} \frac{\binom{M}{x} \binom{N-M}{n-x}}{\binom{N}{n}} & \text{for } x = \max[0, n - (N - M)], \dots, \min[n, M] \\ 0 & \text{otherwise} \end{cases}$$

Shorthand notation is: $X \sim H(N, M, n)$.

The **expected value** and the **variance** of the Hypergeometric distribution $H(N, M, n)$:

Navigation icons: information, explained, enhanced, enhanced, interactive

Fertig Internet

Figure 2: Standardization is via an HTML filing card system.

The implementation of the interactive examples into MM*Stat is based on the XploRe Quantlet technology.

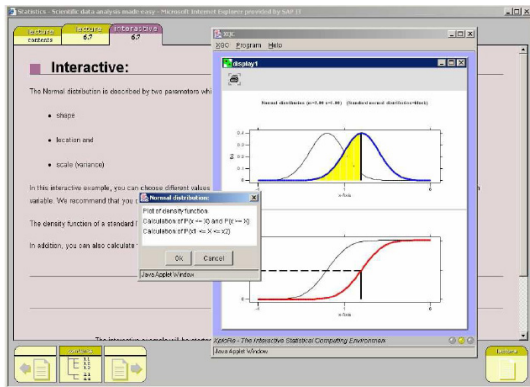


Figure 3: *Interactive example.*

Advantages of MM*Stat:

- Usage in various courses of studies.
- Automatic production from LaTeX via MD*book.
- MM*Stat enables interactive examples.

Limitations of MM*Stat:

- The examples have an economics flavor.
- A specific statistical engine is addressed for the interactive examples.
- Arabic text not possible.

The difficulties of Arabic e-learning systems

- There is a big gap in the e-learning market between Arab countries and Europe, United States.
- The e-learning market is estimated to reach 11 billion dollars in 2008 (Europe, United States).
- In Arab countries it is expected to reach from 50 to 60 million dollars in 2008.
- No statistics platform in Arabic.
- Only two arabic platforms for mathematics, see (<http://aghandoura.com>) , and (<http://www.hesab.net>).



Figure 4: Graphical user interface of ghandoura

The screenshot shows a Microsoft Internet Explorer browser window displaying the website 'www.hesab.net'. The browser's address bar shows the URL. The website has a blue header with the title 'جزيرة الرياضيات' (Mathematics Island) and a navigation menu with items like 'الرئيسية', 'المنتدى', 'انضم إلينا', 'التسجيل البريدية', 'سجل الزوار', 'آخر التحديثات', 'أرسل الموقع لتدقيق', 'رخصتي', 'لن الموقع', 'من أنا', and 'اتصل بنا'. Below the header is a large green button with the text 'من هنا دروس النسيبة و التناسب'. The main content area features a central message box with Arabic text, and a sidebar on the left with a list of links under the heading 'مكتبة البرامج' (Software Library). The sidebar links include 'برامج رياضيات لأستاذ خليل', 'برامج رياضيات للفرحة الابتدائية', 'برامج رياضيات للفرحة الإعدادية', 'برامج رياضيات للفرحة الثانوية', 'برامج رياضيات للفرحة الجامعية و ما بعدها', 'برامج الرياضيات العامة', and 'برامج الوسائل التعليمية للرياضيات'. The footer contains the text 'تم طرح دروس نموذجية من الكتاب المدرسي لشبه المنحرف و'.

Figure 5: Graphical user interface of hesab

Some difficulties of design:

- The direction: Writing in Arabic is from right to left.
- LaTeX2HTML: Arab text does not work with LaTeX2HTML.
- Education gap between Europe/ United states and Arab countries.
- Cultural differences: Interest rates, alcohol prohibited.

Media WiKi technology

- Framework for hypertext documents.
- Wiki is an online collaboration model.
- Students may modify contents.
- Arabic words may be entered directly.
- LaTeX is embedded.

Why Wiki?

- Wikis use simple markup rules.
- The WiKi website keeps the old copies of our pages.
- Wikis are fully editable, everyone who reads the Wiki, can work on the pages and provide new pages.
- Great potential as a tool for online collaboration, (<http://teachwiki.wiwi.hu-berlin.de>).



Figure 6: The arabic wiki encyclopaedia home page

- Arabic MM*Stat in Mediawiki. See (<http://pluto.wiwi.hu-berlin.de/mediawiki/index.php>).
- Take content from MM*STAT, adjust to arab requirements.
- Modify examples to adjust to arabic cultural conventions.

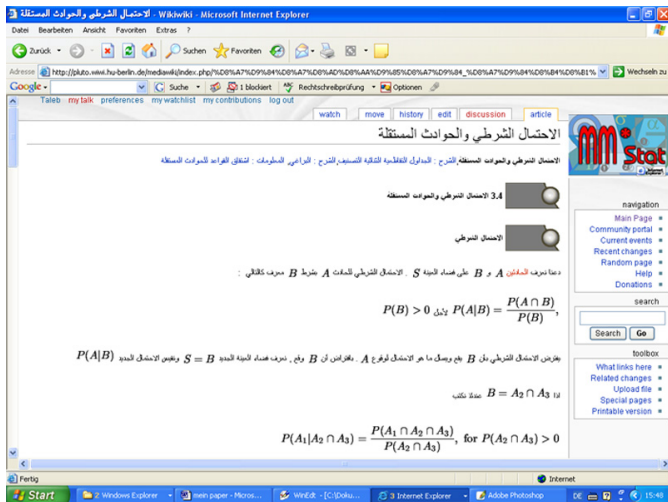


Figure 7: graphical user interface (GUI) of Arabic MM*STAT in WiKi

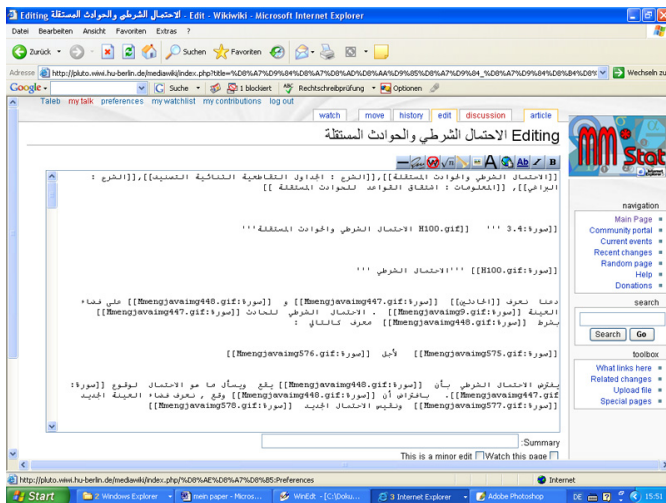


Figure 8: edit state in the ArabWiki

Conclusion

- Arabic users forced to choose: foreign language, or poor Arabic support.
- There is the possibility of creating an e-learning system with Arabic MM*STAT, but it heavily depends on manual work.
- Therefore we propose WiKi technology.
- you are welcome to contribute to Arabic MM*STAT!

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