Innovative Usages of Spreadsheet in Development of Work Efficiency

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Abstract

This paper demonstrates how a spreadsheet can be used as a medium for the improvement of work efficiency of a common man. Improvement in work efficiency will lead to benefit in the job in a positive and profitable way.

This paper shows how a spreadsheet can support the common man using basic skills in professionally-oriented computing applications. The possibility of using the spreadsheet software as a computationally efficient and visually enhanced learning environment makes it possible to study real-life situations of increasingly complex nature and compare them through analysing modelling data. Various facilities of a spreadsheet make it possible for learners to see a manifold of ideas in a clear and natural way. Using these features of a spreadsheet in the preparation teachers, mathematicians, scientists, engineers and other professionals can significantly improve the development of skills that can be transferred across different disciplines and contexts.

Introduction

Nowadays, the use of computer has become essential for development in any field. The capability of a spreadsheet in the development of a skill should not be underestimated. With an excel spreadsheet we are able to do a vast number of tasks, including creating graphs, charts, tables and detailed data reports which are used in major decision making processes.

It is no surprise that excel spreadsheets are one of the world's most widely used mediums, commonly referred to as an uttermost powerful program to be used. The user of the spreadsheet can make changes in any stored value and observe the effects on calculated values. This makes the spreadsheet useful for "what-if" analysis since many cases can be rapidly investigated without tedious manual recalculation. Modern spreadsheet software can have multiple interacting sheets, and can display data either as text and numerals, or in graphical form.

In addition to the fundamental operations of arithmetic and mathematical functions, modern spreadsheets provide built-in functions for common financial and statistical operations. Such calculations can be applied to tabular data with a pre-programmed function in a formula. Spreadsheet programs also provide conditional expressions, functions to convert between text and numbers, and functions that operate on text.

Spreadsheets have now replaced paper-based systems throughout the business world. Although they were first developed for accounting or bookkeeping tasks, they now are used extensively in any context where tabular lists are built, sorted and shared.

VisiCalcwas the first electronic spreadsheet on a microcomputer, and it helped turn the Apple II computerinto a popular and widely used system. Lotus 1-2-3was the leading spreadsheet when DOSwas the dominant operating system. Excelnow has the largest market share on the

Windows and Macintosh platforms.1 A spreadsheet program is a standard feature of an office productivity suite; since the advent of web apps, office suites now also exist in web app form.
Now a days, future teachers, mathematicians, scientists, engineers, and other professionals need skills in acquiring knowledge through the use of digital technology that has dramatically changed learning environment at all levels of education and across all disciplines.

In modern spreadsheet applications, several spreadsheets, often known as worksheets or simply sheets, are gathered together to form a workbook. A workbook is physically represented by a file, containing all the data for the book, the sheets and the cells with the sheets. Worksheets are normally represented by tabs that flip between pages, each one containing one of the sheets, although Numbers changes this model significantly. Cells in a multi-sheet book add the sheet name to their reference, for instance, "Sheet 1!C10". Some systems extend this syntax to allow cell references to different workbooks.

A classic example of modern technology is an electronic spreadsheet. It has been more than two decades since the tool has been used in the teaching of mathematics3, engineering4, and science.5

Spreadsheet and Database

Spreadsheets share many principles and traits of databases, but spreadsheets and databases are not the same thing. A spreadsheet is essentially just one table, whereas a database is a collection of many tables with machine-readablesemantic relationships between them. While it is true that a workbook that contains three sheets is indeed a file containing multiple tables that can interact with each other, it lacks the relational structure of a database. Spreadsheets and databases are interoperable—sheets can be imported into databases to become tables within them, and database queries can be exported into spreadsheets for further analysis.

A spreadsheet program is one of the main components of an office productivity suite, which usually also contains a word processor, a presentation program, and a database management system. Programs within a suite use similar commands for similar functions. Usually sharing data between the components is easier than with a non-integrated collection of functionally equivalent programs. This was particularly an advantage at a time when many personal computer systems used text-mode displays and commands, instead of a graphical user interface.

Nowadays, the software is so widespread that even in many entry-level positions for high-school graduates, skill in creating and operating spreadsheets is a requirement.

It is therefore of the uttermost importance that all employees are given the proper tools and training which will enable them to produce accurate information gathered from the excel spreadsheets.
This skill includes knowledge of many basic techniques such as storing, processing, and representing data within a spreadsheet. Beyond those basics, a spreadsheet, when used appropriately, can provide learners with much needed experience in mathematical modelling. a transferrable skill7 that can be applied in a variety of advanced professional setting such as teaching, doing mathematics research, and solving engineering problems. Using various spreadsheet-based modelling techniques as a background, this article will illustrate and conceptualize the interplay between the acquisition of knowledge and the development of skills typically encountered in the context of formal schooling at the elementary, secondary, and tertiary levels.8
The main goal of learning is to acquire knowledge and to develop various skills. For example, learning to become a teacher requires considerable content knowledge and numerous grade appropriate pedagogical skills.

The importance of the development of skills of physicochemical calculations using graphical methods has been emphasized for more than half a

century.10 However, in the past, such calculations were extremely time-consuming and intellectually challenging.

Nowadays, modern tools of spreadsheet can significantly enhance the construction of graphs of complex equations thereby turning the calculation skills previously considered advanced into basic skills but at a higher cognitive level. Moreover, by using spreadsheet in complex scientific calculations, one can develop the ability of transferring skills from one professional context to another. It is through such a meaningful practice that one type of skills transforms into another and vice versa.

Concluding Remarks

This paper has demonstrated how a spreadsheet can be used as a medium for the development of work efficiency. Its required for the proper training to common man will become skilled at tricks and shortcuts that would ultimately make their job-work easier. This will ultimately lead to common man taking the initiative to find innovative ways to sort out or prevent any potential issues, enabling us to make decisions to benefit the job in a positive and profitable way. A possible approach to overcome this limitation of a spreadsheet is to use it jointly with software that allows for the construction of graphs from any two-variable equation depending on multiple parameters.

This paper showed how spreadsheet can support the common man through using basic skills in professionally-oriented computing applications. The possibility of using the spreadsheet software as a computationally efficient and visually enhanced learning environment makes it possible to study real-life situations of increasingly complex nature and compare them through analyzing modelling data. Various facilities of a spreadsheet, including recurrent counting, interactive construction of graphs of function not defined by a formula, drawing integer-sided rectangles and other types of polygons, using mathematical definitions to format numerical information, make it possible for learners to see a manifold of ideas in a clear and natural way. Using these features of a spreadsheet in the preparation teachers, mathematicians, scientists, engineers and other professionals can significantly improve the development of skills that can be transferred across different disciplines and contexts.

REFERENCES

"Rivals Set Their Sights on Microsoft Office: Can They Topple the Giant? Knowledge@Wharton". Knowledge.wharton.upenn.edu. Retrieved 2010-08-20.

Poyton, T. A. (2004). Computer literacy across the lifespan: a review with implications for educators. Computers in Human Behavior, 21(7): 861-872.

Arganbright, D. E. (1985). Mathematical Applications of Electronic Spreadsheets. New York: MacGraw-Hill. Spreadsheets in Education (eJSiE), Vol. 3, Iss.3 [2010], Art.5, http://epublications.bond. edu.au/ejsie/vol3/iss3/5

Wankat, P., and Oreovicz, F. S. (1993). Teaching Engineering. New York: McGraw-Hill. Spreadsheets in Education (eJSiE), Vol. 3, Iss.3 [2010], Art. 5

Filby, G. (ed.). (1998). Spreadsheets in Science and Engineering. Berlin: Springer-Verlag.

Conference Board of the Mathematical Sciences. (2001). The Mathematical Education of Teachers. Washington, D.C. The Mathematical Association of America.

Kemp, I. J., and Seagraves, L. (1995). Transferable skills .can higher education deliver? Studies in Higher Education, 20(3): 315-328.

Abramovich, S., Nikitina, G., and Romanenko, V. (2002). Developing practical competence of future engineers within a theory-oriented curriculum at the tertiary level. Herald of Education and Science Development of Russian Academy of Natural Sciences (special issue in English), 4: 24-30.

Shulman, L. (1986). Those who understand: knowledge growth in teaching. Educational Researcher, 15 (2): 4-14.

Guggenheim, E. A., and Prue, J. E. (1956). Physicochemical Calculations. North Holland Publishing Company: Amsterdam.