

USEFUL APPLICATIONS/SOFTWARE FOR MATHEMATICS

TEACHING IN SCHOOL EDUCATION

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ABSTRACT

Modern technologies are highly supportable for mathematics teaching. Several software is available in Internet for the provision of mathematics teaching in school level. Every teachers and students should have knowledge of these technological tools for proper utilization of their teaching learning activities. In this study several mathematics related software, ideas of their application and their effect has been included. So teachers, students and other related stakeholders can get software related knowledge and promoted their skills for their further pedagogical practices.

KEYWORDS: ICT, Mathematics Teaching, Software

INTRODUCTION

Several streams have integrated in school mathematics like set theory, numerical calculation, measurement of length, perimeter, area and volume of two dimensional and three dimensional objects, drawing 2D and 3D figures, equation solving and graphical representation, transformation, trigonometric, exponential and logarithm functions related calculation and problem solving, operations of matrix and determinant, vector, statistics and so on. These concepts are really difficult to teach by the help of board and marker hence verities of digital devices can be used for its effectiveness. Several mathematics teaching related software or digital resources are available in the Internet. Each software has separate functions and applications. Teachers can choose any application/software on the basis of nature of their subject matter. Mathematics teacher can use digital resources in varieties of ways to support their teaching learning process, for that regard, they required high level of computer competency.

Maximum mathematics teachers may be unaware about subjective related software and its applications hence this study will partially support to them. Mainly every teacher should have knowledge of subject related software and its implications for their regular classroom practices. Many of the research report shows ICT is very supportive for teachers and students to learn mathematics easily and effectively. Granberga & Olsson (2015) investigated that dynamic software program, GeoGebra, support students' collaboration and creative reasoning during mathematical problem solving. Lu, Tsai & Wu (2015) initiated that video classrooms, e-lesson preparation rooms, microteaching classrooms and Interactive Whiteboard for the training of teaching methods become popular under multi-function classrooms. Mirazchiyaski (2014) suggested that computer software provides new opportunity to the teacher for better mathematics teaching. Pachemska et al (2014) found that mathematics achievement of ICT applied class students were very higher than other students. Safdar et al. (2011) showed that sets, algebraic expression and logarithm can effectively taught by using Algebra Solver Software, Algebra Helper, Cool Math, SOS mathematics, Web Math, Algebraic Info Mathematics. Agyei & Voogt (2010) suggested that ICT should be integrated into the curriculum and manage required hardware and software related

ICT instruments in school. Goos (2010) advocated that ICT is useful for graphic representation, numerical calculation and to give real concept of geometric figure during teaching and learning period of mathematics. Anthony & Walshaw (2009) suggested that several technological tools should manage in the classroom for mathematics teaching such as calculator and computer applications, presentation technologies, digital and mobile technologies, and the Internet. Drews (2007) mentioned some potential resources for mathematics teachings as manipulatives, images, ICT, mathematical games, worksheets and textbooks and everyday materials. Aydın, Emin (2005) highlighted that Excel, Logo, Computer Algebra System, Databases Communication Facilities and Word Processing are general applications for mathematics and Even Derive, Mathematica, MathCad, MatLab, and Maple have included under Computer Algebra System. Keong, Horani & Daniel (2005) found some software used by Mathematics teachers were using application packages as word processing packages, spreadsheets, search engines, presentation software and drill and practice software. Becta (2003) mentioned that teachers have to maximise the input of ICT in mathematics teaching as a instructional tool, developing knowledge of different relevant software and multimedia, and incorporating the use of convenient ICT equipments in teaching practices. Logo, Computer Algebra Systems Maths Curriculum Software, Interactive Whiteboard and Dynamic Geometry Systems were also highlighted as superlative tools for mathematics teaching. Bergqvist, Holmquist & Lingefjard (2000) suggested that scientific and graphic calculators and other subjective software are more beneficial for mathematics teaching. R. F. Church house et al. (1986) mentioned four types of computer implications in the mathematics classrooms as graphic possibilities, self-evaluation and individualized instruction, assessment and recording and students errors.

MATHEMATICS RELATED SOFTWARE

Several software is available in Internet few of them are mentioned under this study. Fulbrighter (2013) highlighted that camera/video, probes, Smartphone, microphone/ loudspeaker, iPad/tablet, classroom response system, document camera, chalk/marker, projector, calculator, interactive whiteboard and computer are ICT related instructional materials for math/science teaching. Butler (2005) highlighted that several software have been developed as, Dynamic Algebra System, Graphing Calculator, Calc 3D Pro, Dynamic Omni Graph Evaluation, Cinderella 2, Graphers and so on related to mathematics. NCETM (2010) mentioned some use full software for secondary level mathematics teaching are Acrobat Reader, Adobe (or another) SVG Viewer, Animation Software, Bowland Mathematics Materials, Data Logging Software, Digital Image Manipulator such as Picasa, Drawing Program, Equation-Editor as FX-Maths Pack, Internet Based Programs (EXP Maths 7, 8 and 9, Flash, java, Shockwave), Formulator Tarsia, geometry related software (Geometer's SketchPad, Cabri-Geometre or GeoGebra), Google Earth, graph drawing package (Omnigraph, Autograph, GeoGebra), graphic calculator, Interactive Whiteboard Software, Internet Browser (Plus Anti-Virus, Firewall, Anti-Spy-Ware Software), Mathematica Player, Media Player, Photograph and Music Compilation Software, Sound and Audio Editor, Spreadsheet, Statistics Software (Autograph, Fathom, Tinkerplots), TV access, Video Conversion Software, Virtual Manipulatives, Word Processor and YouTube.

Several software have been developed for the purpose of mathematics teaching which are separated under content free software which refers commonly used software like as writing software, art and design software, image editing software, multimedia authoring and presentation software, concept mapping software, database software and spreadsheet software, programming software, etc., and content rich software represents the specific software which can be used in mathematics teaching like as GeoGebra, Matlab, Maple, Mathematica (Lovasz, 2008). Math Type, Genius Maker Free Education, 3D Grapher, SPSS, Graphic Calculator, Encarta, Microsoft Mathematics and so on. Mathematics content rich

software is presented in Figure 1.

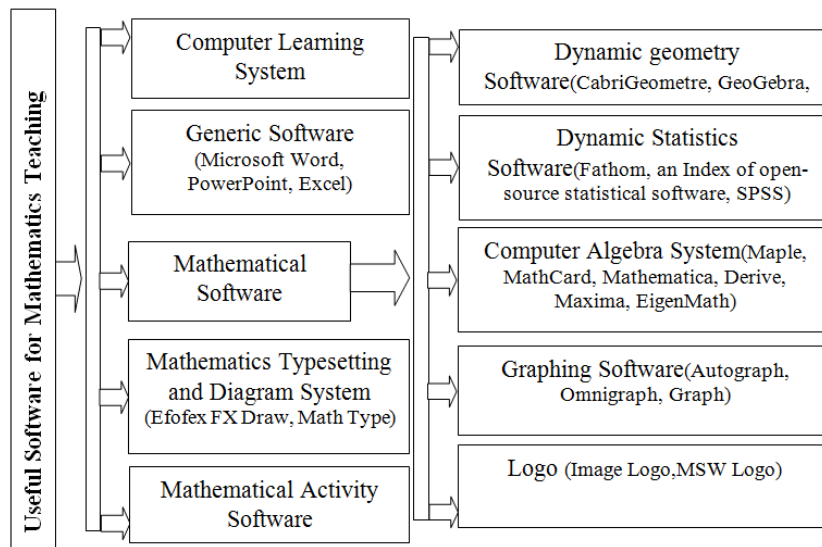


Figure 1: Classification of Mathematics Teaching Related Software

MOBILE APPS

Mobile technology and smart phones are popular in these years which are extra functional for Internet surfing, SMS and email services, use of mathematics related software (Drijvers, Paul, 2012) mathematical problem solving. Adopting mobile technologies in classroom teaching can provide different teachers with practical experience and training opportunities to acquire knowledge and stimulate thinking (Chiu & Churchill, 2016). Varieties of mobile apps are available in Internet which can be downloaded and use for mathematics learning as Operation Math, Sushi Monster, Quick Math - Arithmetic & Times Tables, Pet Bingo by Duck Duck Moose, Meerkat Math HD, Math Flash Cards, 10monkeys Multiplication, Math Monsters-Bingo, Math vs. Zombies, YodelOh Math Mountain (Burns, 2014), Math Tricks, Maths Formulas Free, Mathematics, Math Flash Cards, Complete Mathematics, Mathematics Dictionary, Math Expert, GMAT Math Flashcards Graphing Calculator, GeoGebra, Geometry Pad, Mathway, Free Geo Mathematics.

APPLICATIONS OF SOFTWARE/TOOLS

There are several software for the support of mathematics teaching which are mentioned above and only short description of few software have mentioned under this sub topic. *3D Grapher* can be used to plot and animate 2D and 3D related equations, *Advanced Grapher* software is usable for graphing, curve fitting and for calculation, *Algae Programming* is usable for numerical analysis, *Autograph* can be used for coordinate geometry as plotting up to 3D shaped figure, rotation and reflection, vectors, graphs, differential equations, transformations, probability and statistics, *Brain Builder Math Edition* has so many mathematics related puzzles, *Cabri* is useful for secondary school geometry teaching, *Calc 3D* is usable in vector, matrices and complex number related calculations, *DataFit* software is useful for curve fitting and curve plotting, *Graphic Calculator* is useful for numerical calculation, graphical representation and solution of linear, and trigonometric functions, calculation of roots, factors and others, *Math Type* is useful for typing mathematical notations, symbols, statements and equations, *Efofex* is useful for mathematics teachers, *Encarta* is useful for mathematics and other subjects actually basic formulae, definitions and numerical calculations are available under this software, *Genius Maker*

software is highly useful for school mathematics and science teaching and by its help we can solve sequence and series, algebra, matrices, trigonometric equation, transformation related problems, mensuration related problems and others mathematics related problems, *MathEduSoft* is useful for integrated graphical, complex, matrix, polynomial, rational function, binary and logic calculator, *Mathematica* is useful for several mathematics related problem solving in school education, problem solving, *GeoGebra* is highly popular software in the field of mathematics teaching we can provide several mathematical concepts by using this software, *Excel* can be used for statistical calculations, graph plotting and making charts, *SPSS* also useful for statistical calculation, making charts and graph plotting, *Paint* is useful for drawing figures, editing figures, adding text coloring figures transformation of figures, *Microsoft mathematics* is very useful software for school level mathematics for plotting graphs of different nature of functions, numerical calculation, factorization and others.

ACCESS OF GETTING SOFTWARE AND SOME IDEAS TO LEARN THEIR APPLICATIONS

Some students and mathematics teachers can be found in confusion and unaware nearby the ways of getting software hence for them, it can be suggest that maximum software can be downloaded freely in the Internet. We can directly search software for free downloaded and some software are payable. Payable software can be taken by sharing amount of more than one person or institutions because it may be costly for individually purchasing. Furthermore user guide of maximum software are available in the Internet so interested person can learn themselves by its help. Additionally, some videos are available in YouTube to guide the learners. Thus it can be said that interested learners can easily get essential matters and information's by the help of Internet surfing. One additional thing is that the learner should have basic knowledge of English language understanding.

CONCLUSIONS

From the above discussion it is concluded that if any learners are interested and they have related devices like computer/laptop, mobile, Internet and others they can easily get some common and usable software, user guides and relevant videos in the Internet. Most important thing is the interest of persons and availability of instruments in home or institutions. In this age related institutions should provide opportunity to their staffs for its proper usage in their pedagogical practices.

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