

A vision splendid

SHARON LONDON was fortunate to be among the group of people who developed HOTmaths into a new approach to online maths learning. Read about this affordable home/school-tutoring program.

Step back a few years, and picture two friends sitting and chatting about life as they watched a teenage son being tutored in maths. One said to the other... 'What about parents who can't afford tutoring for their kids?' From that simple throw-away question, Shane Barry and Don Colless totally changed their life directions and HOTmaths was born.

HOTmaths is an online program being created by teams of Australian educators, and is based directly on the requirements of the Australian State and Territory curriculums.

HOTmaths provides a flexible online environment where teaching, learning, assessment and reporting occur seamlessly at any time and place. Students can read text related to their chosen topic and lesson, explore animations and interactives, practise skills at various levels, solve challenging problems, investigate open-ended situations, and test their understanding at any stage. They can complete activities in any order and repeat them at will.

Research on visual learning and dynamic imagery directed the development of Flash animations and interactives (called widgets) linked to each lesson. Working Mathematically research resulted in open investigations, problem-solving tasks and higher-order thinking questions linking directly to the relevant content. Research on student-directed learning influenced the feedback process and the decision-making steps provided to students in order to develop their independent learning skills. The lessons continue to be extensively

tried in a range of classrooms with varying levels of technology access.

Using HOTmaths, students receive immediate feedback to assess their learning at any point, creating a responsive assessment for learning environment. Teachers can access a wealth of information on student progress and communicate directly with them online, thus allowing for individualised learning pathways. Parents can view lessons, access their child's results and send them messages.

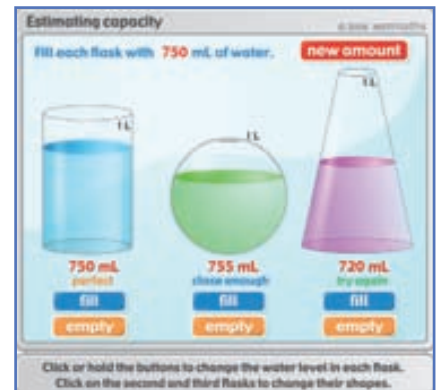
Being Internet-based, HOTmaths can also be regularly updated in response to syllabus changes and the latest findings on students' learning needs.

How is HOTmaths being used?

Regardless of any technology limitations in the school or of teacher experiences with technology in the classroom, there are HOTmaths' approaches that work.

To engage students in class

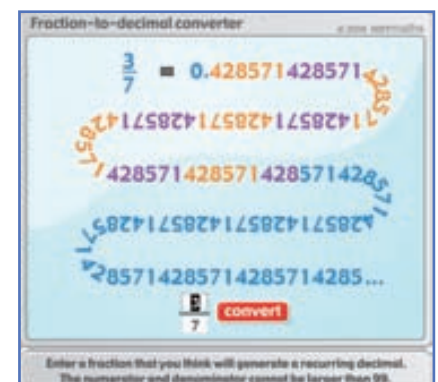
Beginners to technology in the classroom find that projecting the animations and investigations onto the classroom whiteboard changes the climate of their lessons. Imagine an animation showing the nets of solids opening and closing in a variety of ways, or an interactive investigation estimating different capacities in unusually shaped containers. Using HOTmaths with an interactive whiteboard provides investigation and exploration opportunities eliciting whole-class involvement, discussion and reflection.



HOTmaths is attempting to heighten the effect of dynamic imagery and visualisation on student learning by embedding animation and interactivity throughout all aspects of the learning program.

With additional print material

Teachers can pair these whiteboard investigations with printouts from the HOTmaths site (called Hotsheets and Hotgrids). Hotsheets provide a range of activities, such as card-matching to build a summary of types of angles and their descriptions, or geometric constructions, through to extended research tasks on Fibonacci numbers or open investigations on estimating time with the HOTmaths stopwatch, requiring sustained responses and reflection. For example, when learning about recurring decimals, students investigate what makes certain fractions repeat in decimal form and others not via a Hotsheet and the online fraction-to-decimal converter.



For homework

In many classes, students are asked to do homework on HOTmaths. To avoid equity issues with technology access at home, computer labs are made available for students (e.g. at lunchtimes). One teacher is trying pre-learning in some lessons, where students are asked to complete lessons and assessments online for homework then class time is used for group and whole-class investigations based on the lesson content.

In a computer lab

Often, teachers embed computer lab lessons once a week or fortnight into their teaching program, where all students are online and using the complete learning program of HOTmaths. These lessons are also effective in covering a teacher absence. Students work at their own pace and their own level. All work is computer-marked with results immediately updated in the student report section. Having access to a learning profile of what they know and what they still need to learn helps students decide what to work on, and in what order.



As a distance education resource

Students in remote areas use HOTmaths to supplement their distance education print materials. Their teachers see online exactly what work the students are completing, what levels they are achieving and then message them about this work.

When a student is absent

When a student is absent from school, HOTmaths has the lesson support to help that child catch up.

As an assessment tool

Teachers can use computer lab lessons to assess the whole class on a topic using topic quizzes written at a range of different levels. These tests are designed so that students can redo tests, each time being presented with different questions written on the same lesson outcomes. After their first attempt, students are given the choice of a number of tasks that could improve their understanding, followed by another attempt at a topic quiz.

As a reporting tool

Teachers frequently comment on the usefulness of the reports section of the site. Recognising what students know and don't know can redirect the whole teaching-learning process. Teachers can see who did their homework, who had problems, and the level each student achieved. Topic reports show individual and whole-class progress as well as lesson-by-lesson test results. These reports are exportable to Excel and printable for records, for student learning portfolios and for parent-teacher meetings.

As a communication tool

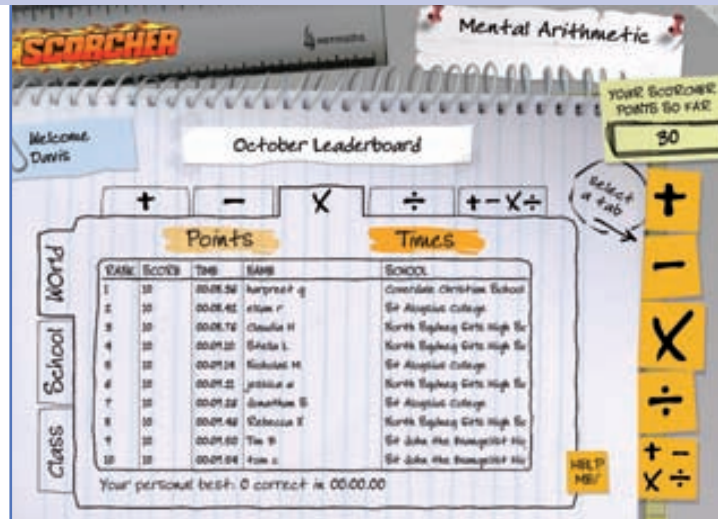
As teachers see learning issues with individual students, groups or a whole class, they can message those students through the HOTmaths message system, giving them an indication of what they need to do to improve.

To practise basic skills

Students are frequently accessing the new Scorchers section of the site, a quick skills practice section with a points system and leaderboard.

To support student teachers and teachers

As a professional development resource, HOTmaths has helped



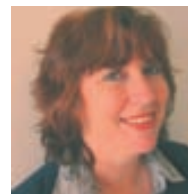
teachers come to grips with the Working Mathematically curriculum. Student teachers presently using HOTmaths are finding an exciting range of teaching and investigation ideas embedded in the lessons, ideas that can be used in their classrooms.

Future directions

Many NSW Government schools have trialled HOTmaths successfully with further trials planned for western Sydney schools. HOTmaths will work closely with the Centre for Research in Mathematics and Science Education (CRiMSE) at Macquarie University in 2007, researching the effectiveness of a range of implementation models of the learning system. ☺

"My students can't wait to get to maths when they know we are going to be using HOTmaths."

"After using the resources for percentages, this class (bottom year 8) performed as well as the next class up on the conventional topic test."



Sharon London is manager of schools and higher education for HOTmaths.