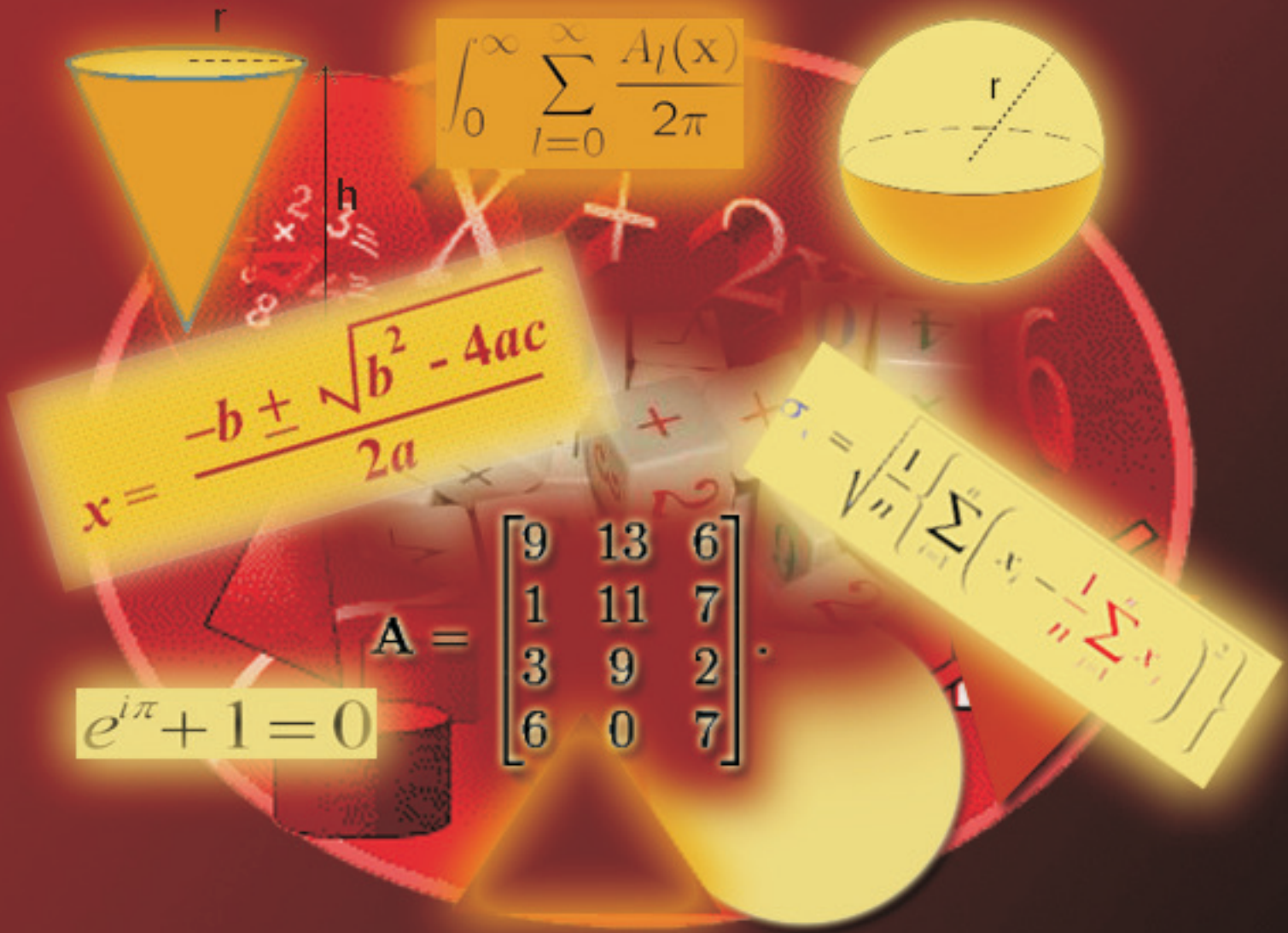


LEARNING RAMPS™ for Mastering Maths



As of 9th February 2012



www.mmpant.net

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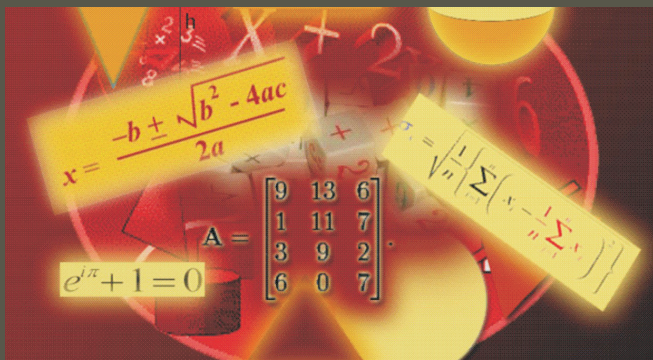
Omni present, 21st Century & the Soul & Beauty of Maths

Learning 221

PROGRAM SCHEMATICS

Colors
Code

Level



The Beauty and Soul of Maths					Violet	7
21st Century Maths					Indigo	6
Omnipresent Maths					Blue	5
Grade : 1, 2, 3 Age: 6-8 Mastering Maths 4α	Grade : 3, 4, 5 Age: 8-10 Mastering Maths 4β	Grade : 6, 7, 8 Age: 11-13 Mastering Maths 4γ	Grade : 9, 10 Age: 14-15 Mastering Maths 4δ	Grade : 11, 12 Age: 16-17 Mastering Maths 4ε	Green	4
Grade : 1, 2, 3 Age: 6-8 Fascinated with Maths 3α	Grade : 3, 4, 5 Age: 8-10 Fascinated with Maths 3β	Grade : 6, 7, 8 Age: 11-13 Fascinated with Maths 3γ	Grade : 9, 10 Age: 14-15 Fascinated with Maths 3δ	Grade : 11, 12 Age: 16-17 Fascinated with Maths 3ε	Yellow	3
Grade : 1, 2, 3 Age: 6-8 I love learning Maths 2α	Grade : 3, 4, 5 Age: 8-10 I love learning Maths 2β	Grade : 6, 7, 8 Age: 11-13 I love learning Maths 2γ	Grade : 9, 10 Age: 14-15 I love learning Maths 2δ	Grade : 11, 12 Age: 16-17 I love learning Maths 2ε	Orange	2
Grade : 1, 2, 3 Age: 6-8 Overcoming Maths Phobia 1α	Grade : 3, 4, 5 Age: 8-10 Overcoming Maths Phobia 1β	Grade : 6, 7, 8 Age: 11-13 Overcoming Maths Phobia 1γ	Grade : 9, 10 Age: 14-15 Overcoming Maths Phobia 1δ	Grade : 11, 12 Age: 16-17 Overcoming Maths Phobia 1ε	Red	1

ABOUT THE PROGRAM

Just as the importance of Mathematical Skills in the present and future is undoubted, there is almost universal agreement that it is Maths which is the most challenging subject learnt at the School stage.

From Maths anxiety, maths avoidance, maths phobia and discalculia, there is a range of responses to Maths teaching at the School level. In many cases it is the maths teachers themselves that are responsible for this.

As a child progresses in his learning of Maths, he moves on from integers, whole numbers to negative numbers, to fractions and decimals and conceptually difficult steps, and has to largely fend for himself with no help from the teachers or parents in progressing in this journey.

Imagine a child who is completely at par in his Maths learning till Class 5 like most other children, and then starts slipping a bit to a level where he knows about half of what he should know in the class. He is declared pass with 50%. And if he maintains this performance at classes 6,7,8,9,10, when he passes class 10, he would know $\frac{1}{32}$ or about 3% of what he should have known. No wonder he is nowhere near being able to compete for higher education, no matter how much is spent on remedial coaching. Instead of 50%, even if he achieved 80% at each of the said classes, he would end up with a little less than 33% of what he should be knowing. One could give more illustrations, but the point that quickly comes through is that there is no option but to master maths at each stage through the years at School, if one is to be adequately equipped.



Most efforts at improving Maths learning, tend to work on intense focused memorization to deal with imminent tests, repeating the same pedagogical approach that failed in class. Hence results are unreliable, and the few examples of success are used to justify the model. Global Learning Systems, such as Kumon have been built on this model of regular practice with 'little and often' and have their adopters as well as critics. More recently the Khan Academy has received a lot of attention because of the interest that Bill Gates and Google have taken in it.

But there is more to Math learning than Kumon, Khan Academy or hundreds of other web-based tutorial services. And this is about transforming a reluctant and passive learner to an enthusiastic, motivated and active learner. In that sense we would not be teaching Maths per se, and it is our belief that upon going through all stages of our program the learner would be able to learn Maths well on his own, have an interest in it and achieve highest grades in all Maths exams that he takes. Of course, he can still join Kumon, or use Khan Academy or any other Maths teaching program preferred.

A wide range of cognitive abilities are necessary to successfully learn Mathematics. The interventions in these programs are meant to provide and strengthen these, so that the learner moves up the levels from 'Overcoming Maths Phobia', to 'I love learning Maths', to 'Fascinating Maths' onwards to 'Mastering Maths'. While the program goes through these stages, at the earlier, the emphasis is more on the psychological and behavioural dimensions, and in the later 2 stages there is more emphasis on removing the blocks to maths learning and clearing misconceptions. The different modules are designed in such a manner that while there are 4 stages of Maths abilities, there is also segmentation across class and age levels as follows: Classes 1,2 and 3 are grouped together and labeled 'alpha'. Classes 3,4,5 are grouped together as 'beta'. Some learners at class 3 may fit better in 'alpha' while some brighter ones may be more suitable for 'beta'. Then classes 6,7,8 are again grouped together as 'gamma'. The secondary stage of classes 9 and 10 is labeled 'delta' and the senior secondary stage of 11 and 12 is labeled 'delta'.

Obviously it would seem that the earlier a learner enters the program, the better would be the expected results.

DELIVERY MODELS

Mentoring & Coaching



Learning Ramps

- Flexible & Distributed Learning (FDL) for Groups
- Personalized & Customized Learning (PCL) for Individuals

OVERCOMING MATHS PHOBIA

About the Program

A majority of the population is mortally terrified of anything to do with Mathematics. This irrational fear of one of the most creative expressions of the human mind, is developed very early in the first few years of Schooling. Parents and Teachers often contribute to this. In order to strike at the root of the problem, this program develops an approach to mathematics which overcomes this fear to develop an interest in and appreciation of Mathematics. It instills confidence in tackling Mathematical concepts and problems.

The program is delivered in a very engaging manner with stories, anecdotes, puzzles leading to a love for Mathematics. Use of web-based resources, such as the Khan Academy are introduced.

Structure

The Program is delivered in 2 formats. One as a one hour talk which is of a general nature, and provides narratives from all over to help learners handle their traumatic experiences with early Maths learning that caused the phobia.

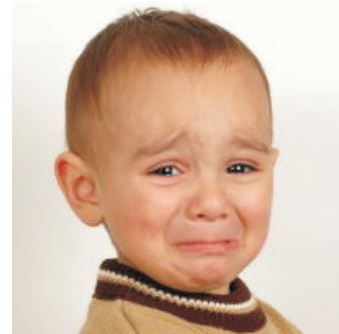
The other is a 10 hour program, which then develops an interest in learning maths, overcomes the phobia, instills an interest in the joy of learning Maths.

However note that this is not a Maths teaching program. There is the well known Kumon chain of maths learning centres or the Khan Academy made famous by endorsement by Bill Gates or projects like Motion Maths and Mathemazium and many other websites with a similar purpose.

This program tries to deal with the core fear and is a motivational, inspirational and transformational program, rather than a tutoring program. We can help you choose a good maths tutoring program suitable to you, once your fear of maths is gone and you start loving the challenges and excitement.

Like most other 10 hour programs in this suite, there will be a one hour pre-program self-study materials that will have to be transacted before participating in the sessions.

And there will be a 3 hour activity after the program, upon doing which, the learner will see the phobia disappearing and self-confidence appearing.



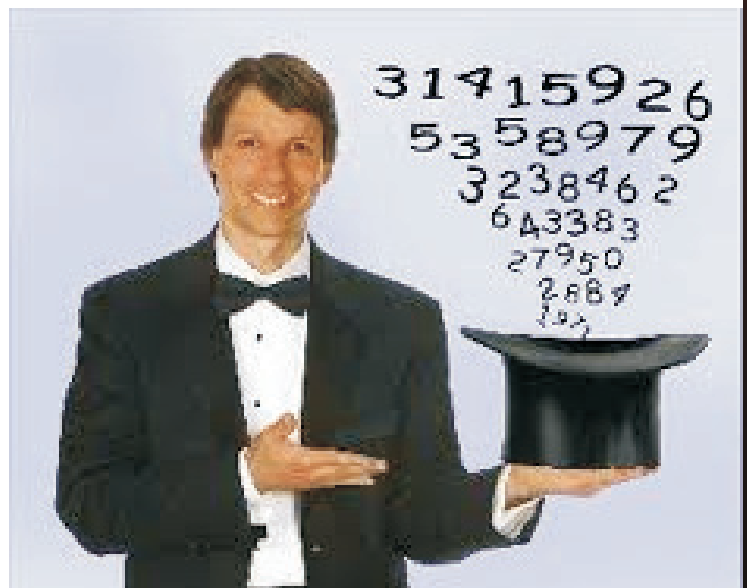
Modules

Session 1: What caused the Maths Phobia?

Session 2: Proof that you're not really no good in Maths.

Session 3: Forget what everyone has always told you. Maths is not all that tough or boring.

Session 4: Maths is all around you and the two of you can be good friends.



- Flexible & Distributed Learning (FDL) for Groups
- Personalized & Customized Learning (PCL) for Individuals

FASCINATING MATHS AND I LOVE LEARNING MATHS

Fascinated with Maths:

These program's address issues of what may be called 'Meta-Mathematics' and the purpose is to develop a change in the mindset of the learners.

In the earlier program, the emphasis has been on overcoming Maths Phobia and when this has been successfully done, the learner starts appreciating Mathematics in a way which is new and leads to a certain amount of fascination with Mathematics. An excitement about it, an understanding of things previously not understood or mis-understood.

The Fascinated with Maths programs then lead on to a desire to learn more Maths, maybe the real Maths and acquire and demonstrate proficiency in Mathematical skills.

I love learning Maths:

From fascination springs love for learning and acquiring new skills and competencies. Not only the ability to do things that one was incapable of doing before, but also at a faster pace with less errors and more accuracy and correctness.

The state of a desire for learning Mathematics is one that naturally leads to success and achievement in terms of academic scores and better performance in all assessments including Board exams and competitive admission tests.

As the success in learning Maths becomes observable, the learner seeks higher goals not being content with just a better performance than in the past. He is now poised for achieving Mastery in the subject and is ready for the next stage of Mastery Learning.



- Flexible & Distributed Learning (FDL) for Groups
- Personalized & Customized Learning (PCL) for Individuals

MASTERING MATHS

After having progressed through the earlier stages, the learner is now ready to move on to Mastering Maths. Once the barriers to learning Maths such as Maths anxiety and Maths phobia have been overcome, the learner can address the conceptual and skill gaps in his knowledge of Maths.

The principles of Mastery Learning have been enunciated by John B Carroll in 1963 when he argued for the idea that the quantum of student learning is reflective of the learning rate.

Bloom followed the lead indicated by Carroll's research which had challenged the traditional view that "some students can learn and others cannot" by suggesting that the difference could be that some students were faster learners and some students were slower learners. This view at least gave some degree of hope for the vast majority who were not succeeding in school.

Carroll identified two factors that affected the learning rate of a student, perseverance of the student, and the opportunity to learn. The first is controlled by the student, that is, how much time they spend on learning, the former is the time allotted to learn by the classroom, or access to materials, etc.

Bloom concluded that given sufficient time and quality instruction, nearly all students could learn.

How to learn for mastery:

1. Clearly identify the learning objectives.
2. The curriculum is divided into relatively small learning units, each with their own objectives and assessment.
3. Learning materials and instructional strategies are identified; learning, practice, formative evaluation, re-learning, reinforcement, and summative evaluation are included.
4. Each unit is preceded by brief diagnostic tests, or formative assessments.
5. The results of formative tests are used to provide supplementary instruction, or corrective activities to help the learner overcome problems.



NO STUDENT IS TO PROCEED TO NEW MATERIAL UNTIL BASIC PREREQUISITE MATERIAL IS MASTERED

Mastery Learning, ML, is an instructional strategy based on the principle that all students can learn a set of reasonable objectives with appropriate instruction and sufficient time to learn. ML puts the techniques of tutoring and individualized instruction into a group learning situation and brings the learning strategies of successful students to nearly all the students of a given group. In its full form it includes a philosophy, curriculum structure, instructional model, the alignment of student assessment, and a teaching approach.

The Keller Plan, also called the Personalized System of Instruction (PSI), was developed by Fred S. Keller with J. Gilmour Sherman, Carolina Bori, and Rodolpho Azzi in the middle 1960s as an innovative method of instruction. PSI was conceived of as an application of Skinner's theories of learning, grounded in operant conditioning strategies of behaviorism. Keller argued that effective instruction should incorporate five principles, the essential elements of the Keller Plan:

- Written materials
- Units of content
- Self-paced instruction
- Unit mastery
- Proctors

The Keller Plan has mainly found been used in higher education, particularly as a more personalized form of instruction in large classes, but there is nothing inherent in Keller's formulation to restrict its application to particular grade levels, content, or types of courses. There has been a good deal of research on the effectiveness of PSI which indicated that it had robust, significantly positive on learning when compared to more traditional lecture-based formats.

- Flexible & Distributed Learning (FDL) for Groups
- Personalized & Customized Learning (PCL) for Individuals

OMNI PRESENT, 21ST CENTURY & THE SOUL & BEAUTY OF MATHS

The Soul & Beauty of Maths

Maths is both fascinating or frustrating depending upon whom you speak to. This program takes the learner beyond mastering the methods and tools that form the subject matter of School Mathematics, to an appreciation of the soul of Mathematics and the inherent creative spirit, almost like poetry.

In another quite unusual approach, this program will not be so much about the learner getting to learn, what the authors, creators and designers of the program know. It is about what else is worth knowing/ what is worth pursuing in the quest for Mathematical Knowledge?

The key message from this program is that Maths is just a tool of Philosophy. It is a way to work with ideas, to develop them, to flesh them out, to understand them.

21st Century Mathematics

The Internet and Computer changes everything. All the Mathematics that you learn at School was developed when Computers were not there. Beginning with numbers, through algebra, geometry, co-ordinate geometry, trigonometry and calculus, although some of these may appear difficult to learn, they are several hundred to thousands of years old knowledge. In no other subject, other than history do you deal with such ancient and archaic stuff.

Omni-present Maths

We often tend to think of School Level Mathematics as a useful subject only for Science or Engineering Education or careers in these allied fields.

Consider the following list of certain aspects of mathematical thinking that are crucial in typical adult's everyday life:

- Understanding whole numbers, fractions, percentages and ratios= critical to time and money management, including everything from balancing an account to choosing mortgages, loans and making investments.
- Understanding Spatial relations- crucial for reading maps and finding your way about, even with the help that you may get from Google.
- Understanding functions- crucial for understanding energy costs, or for that matter even the blood sugar levels management for a diabetic, which varies with exercise, consumption of sweets and intake of insulin

Even as a MacDonald or Haldiram employee, if you keep getting the Maths wrong, you won't last.

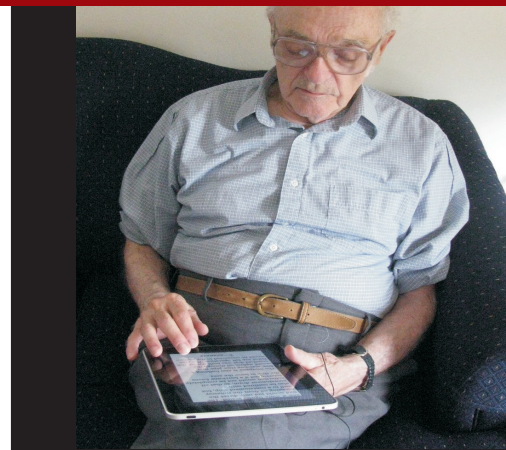
1	+	1	=	2
1 2	+	2 1	=	3 3
1 2 3	+	3 2 1	=	4 4 4
1 2 3 4	+	4 3 2 1	=	5 5 5 5
1 2 3 4 5	+	5 4 3 2 1	=	6 6 6 6 6
1 2 3 4 5 6	+	6 5 4 3 2 1	=	7 7 7 7 7 7
1 2 3 4 5 6 7	+	7 6 5 4 3 2 1	=	8 8 8 8 8 8 8
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- Flexible & Distributed Learning (FDL) for Groups
- Personalized & Customized Learning (PCL) for Individuals

Learning 221™

Group A : Life-long Learning

A1.Learning for Success	50 hours
A2.Learning to Think	50 hours
A3.Becoming a 21st Century Educator	50 hours
A4.Leadership at Work	50 hours
A5.Enlightened Parenthood	50 hours
A6.The Pursuit of Happiness	50 hours



Group B : The Hexagon of Success

B1. Leadership 101: Lead and not follow	10 hours
B2. Futurology 101: Anticipating the Future	10 hours
B3. Decision Making 101: Taking Better Decisions	10 hours
B4. Creativity 101: Everyday Creativity	10 hours
B5. Ethics 101: Nurturing an Ethical Mind	10 hours
B6. Innovation 101: Becoming a Serial Innovator	10 hours

Group C : The Long Tail

C1. Asking the Right Questions?	1 hour
C2. 21st Century Learning Skills	10 hours
C3. Learning Analytics	10 hours
C4. The Art and Technology of Digital Story telling	1 hour; 10 hours; 30 hours
C5. Pre-natal, Neo-natal and Pre-School Learning	1 hour; 10 hours; 30 hours
C6. Quantum Computing: The next Frontier	1 hour; 10 hours; 30 hours
C7. 21st Century Managers Toolkit	100 hours
C8. The Edupreneurs Toolkit	100 hours
C9. From 'No' English to 'Know' English	100 hours
C10. Academic Skills for 21st Century Higher Education	100 hours
C11. MSI (Measures, Scales and Instruments) for Creativity, Innovation, Learning, Information Literacy, Financial Literacy etc.	130 hours





LIVE Learning™ with



TABLETS AND MOBILES

ABOUT THE PROGRAM

This program has been designed to respond to the urgent and immediate need to train a very large number of teachers to effectively adopt new teaching and learning models appropriate for the future. Many learners will have access to devices with access to Mobile Internet and can become exploratory and active learners.

The most important subjects of English Language, Mathematics and Science can be taught in a bore engaging and effective manner with enthusiastic and involved teachers.

The chief architect and mentor of the Program is **Prof.M.M. Pant** a *sui generis* personality with almost 50 years experience in Scientific Research, Teaching, Management, Law, Information Technology and Business Entrepreneurship. He is supported in this mission by a network of very accomplished persons with excellent academic credentials and diverse national and international experience who have agreed to provide inputs, guidance, conduct interactive sessions and mentor the prospective learners to achieve their full potential.

CONTENT HIGHLIGHTS

- ▶ About these Products and Programs
- ▶ Delivering Live Learning in a Classroom
- ▶ LearnPad™, LearnTab™ and the 5 levels of such Devices
- ▶ The Portable Classroom
- ▶ Mathslab with Tabs
- ▶ Sciencelabs with Tabs
- ▶ Language Lab on Tabs
- ▶ Curating and Creating Apps for Learning
- ▶ Using Tablets for Effective Self-learning by Students

LIVE Learning™

■ LearnTAB™



■ LearnPAD™



WHY THIS PROGRAM?

This program, probably one of its kind, is a result of seeking an understanding a rather common phenomenon. The fact that many persons find it extremely challenging to learn mathematical concepts, procedures and facts, although they have a high level of general intelligence that is demonstrated in other aspects of their lives has been known for a fairly long time.

The field of medical treatment continually progresses, because the outcomes of medical research are applied to medical practice. But the outcomes of educational research lie buried in libraries, research journals and Ph.D. theses.

The field of Mathematical Learning disability is about 20 years old, and much knowledge of has accumulated in response to the central question of the field "Why is that some people are better at learning Mathematics, than others?".

The Mastering Maths Program draws upon this body of research and class-room experiences of a number of very experienced teachers to develop this unique program, which is about learning maths, and moving through the stages of 'Maths Phobia' to 'I love learning Maths' to 'Fascinated by Maths' onward to 'Mastering Maths'.



Prof. M.M. Pant (www.mmpant.net) is an internationally renowned expert specialising in pedagogy, technology and the development of tools and curricula for 21st century education.

He has been known for developing, working models that enhance the pedagogy using latest available technologies. He is especially noted for his efforts in leveraging social media for improving learning and bringing the mobile and handhelds into the classroom where they have been traditionally banned.

Prof. Pant's current work and interests revolve around the development, delivery and promotion of educational products, processes and services that cater for the needs and interests of future learners, a framework that is named "**Learning 221™: Learning for the 2nd Decade of the 21st Century**".

His past roles include being the Former Pro-Vice Chancellor, Indira Gandhi National Open University (IGNOU) and being on the faculty of IIT, Kanpur (the premier engineering institution in India), MLNR Engineering College and Faculty as well as Visiting Professor, University of Western Ontario, Canada. He has been a visiting scientist at European research centres in Italy, England, Germany and Sweden.

Prof. Pant is the founder of the LMP Education Trust, an organisation that promotes new age learning and supports underprivileged learners.

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