Strategies in the DAWN of NEW LEARNING with UMathX

The COVID 19 quarantine has magnified the possibilities of the use of online learning and is making it an integral part of today's educational instruction procedures. The personalized nature of online learning in mathematics and coding requires very specialized tools which will create immediate, interactive and adaptive instruction and feedback. This is exactly what UMathX provides. It's goal is deeper conceptual understanding in mathematics and coding for teachers, parents and students in the **DAWN of NEW LEARNING**.

Educators need to plan Multiple Learning Models with a variety of approaches to deliver mathematics in an uncertain future for Fall 2020. Our team suggests detailed steps including online lessons, 3 part model lessons and videos, the first of which is **"Teach, Don't Tell! Strategies in the Dawn of New Learning"** online at **www.umathx.com.**

Multiple Learning Models that we suggest could include a virtual academy in partnership with parents. Perhaps, part of the week would be within a school for some students and some of the time online at home. It could be a homeschool model where parents are in close contact with the school.

This could also apply to teacher education. A mathematics educator at a Faculty of Education is proposing the use of UMathX as an integral part of online Math Education.

Dr. Andrew Allen at the Faculty of Education at the University of Windsor states that, "All mathematics students, including present and future mathematics teachers should have "conceptual" knowledge and understanding of mathematics. That is, they should be able to understand logical patterns and relationships constructed internally and existing in the mind as a part of a network of ideas."

He lists Skills Gaps that students and their teachers often have in mathematical learning:

> **One is a misunderstanding** they have that mathematics is primarily about a set of quick tricks or memorized algorithms without any understanding of concepts or they believe that math is solely about performing complex computational tasks.
>
> **The second is an obsession with getting the correct answer**. That is, they lose sight of the development of mathematical ideas as process and they are obsessed with just the product of a math task. Mathematics must be meaningful. This takes time. Students and teachers need to be aware of their own mathematical thinking and not just what they can produce.

He states that, "Teachers need to abandon the tendency to teach the ways that they were taught and pose worthwhile mathematical tasks, encourage discourse and writing, use mathematical models, encourage cooperative learning groups, pose real problems that interest and engage and focus on conceptual understanding in mathematics."

Before 2000, I met Dr. Seymour Papert, the founder of Logo, the language of learning. My work at that time determined my focus in mathematics education since. In Logo, one learns by teaching and responding to the action of a robot. We are releasing the resource, **"Introduction to Coding Through Robotics – Tools for Thinking"** at this time. It grows out of UMathX to expand the "Understanding Math" vision. Students lead themselves, through coding robots on the floor and on the screen, to an amazing world rich in understandable and usable math concepts.

Since first releases of “Understanding Math”, now in a 10th version as UMathX, we have based understanding on a wide variety of approaches to content rather than falling to telling and memorization. We have worked with consultants and advisors over the years to write 3 part model lessons to share ideas on implementation of the online lessons.

Dr. Allen indicates that for his course in September, he is preparing a 9-week (2hrs/week) Teacher Education and/or Teacher Development program (for both pre-service and in-service teachers). He will start with introducing our Duodecimal number system and Base 10. Then he intends to address students’ fear of math and introduce them to a growth mindset in math. UMathX and the Learning Pit / Growth Mindset within the “Teach don’t Tell” video introduced below works well here. Further, he indicates that he will explore mathematics foundations or Constructivism as a foundation for math learning connecting with UMathX.

After that, he tends to explore patterning and basic number operations (addition, subtraction, multiplication and division – with and without regrouping). He will end the course with a couple weeks spent on detailed lesson planning. Both the content in patterning and basic number operation is definitely a great fit with UMathX. We have added patterning as an example in the video. I feel that many educators and their students make the erroneous conclusion that if they cannot “get it” or “see it” in the first minute or so, that they could never get it. We definitely need an emphasis on grappling towards ideas in patterning. In our video that I will introduce below, we refer repeatedly to the “need to grapple” rather than simply get the answer.

Dr. Allen indicates that he would like to integrate UMathX throughout as an interactive learning environment to introduce the Math curriculum and demonstrate how to plan lessons and walk-through conceptual understanding of mathematical ideas. Students can use UMathX to review concepts and algorithms and procedures and plan their own lessons with the help of the 3 part lessons which model implementation of UMathX. With Student-Teacher access, they can introduce UMathX to their practicum classes and use it to monitor their own students’ learning. UMathX has both a content and a curriculum focus.

Dr. Allen indicates that, because his is a one-semester teacher education course, that students could be given Student-Teacher access for the Fall and only student access for the rest of the year. I will suggest and offer that UMathX be available throughout the year.

The Ontario Math Proficiency Test will help student teachers to prepare for math content.
https://mathproficiencytest.ca/docs/MPT_Assessment_Blueprint_EN_20191127b.pdf
In addition, student teachers could also use the tests within UMathX for Ontario and/or other curricula. We will make these tests available.

Following is a link to the Practice Test that was released this year:
https://www.mathproficiencytest.ca/#/en/applicant/learn/prepare:sample_questions

Student teachers can take the practice test and get a list of the areas that they are weakest in, then they could review those concepts and topic areas and practice them in UMathX. In addition, UMathX also provides tests that are automatically graded. The student is given results and advised where to obtain information on topics in which they have difficulty. This can be shown in the Data Analysis. We will have a video of Data Analysis available on our website shortly.

Again, educators need to plan Multiple Learning Models with a variety of approaches to deliver mathematics in an uncertain future for Fall 2020. Our team suggests detailed steps including online lessons, 3 part model lessons and videos, the first of which is **"Teach, Don't Tell! Strategies in the Dawn of New Learning"** online at **www.umathx.com.** Since many changes have been made to this website, we advise that one clear the cache by bringing up the website and then pressing on **CRTL and F5** at the same time to reveal the latest content.

At www.umathx.com
On the LEFT SIDE, we list 6 Steps in "Strategies in the DAWN of NEW LEARNING"

Step 1. UMathX What is it? Video … explains features of UMathX and their organization.

Step 2. UMathX Online Lessons – Free Access
Click on that line to have 3 examples appear.
Click on an Example, say Ex.1 and directions to the interactive online lesson appear.
The teacher and parent can direct the student to interactive learning here.

Step 3. UMathX 3-Part Model Lessons – Free Access
Click on that line to have 3 examples appear.
Click on an Example, say Ex.1. Steps to a green pen icon .. 3 part lesson appear.
The teacher and parent can print out the 2 page, 3 part lesson for lesson suggestions.

Step 4. UMathX Lesson Videos
Click on a video to match the lesson chosen above.
That will give parent or teacher the option of giving the student a video overview.
Then one could decide to do the online and the 3 part lesson later or earlier.

Step 5. UMathX Training Videos
Select the video**, "Teach, don't Tell! Strategies in the Dawn of New Learning.**
Selected sections can be selected by teacher or parent.
At the end of a section of selected video a **STOP i**s noted to take the learner to the relevant online or 3 part lesson within UMathX.

Menu for the Video will help in finding the specific lesson.
0 to 1:34 .. Introduction
1:34 to 2:32 .. Learning Pit Graphic … then pause video to TALK, THINK
3:22 .. Multiply a 2 Digit by a 2 Digit Number… then pause video to TALK, THINK and DO online and on paper
5:31 .. Add 2 Digit Numbers … Concretely…then pause video to TALK, THINK and DO online and on paper
6:22 .. Subtract 3 Digit Numbers… Concretely ...then pause video to TALK, THINK and DO online and on paper
6:57 .. Fraction Introduction – Pattern Blocks...then pause video to TALK, THINK and DO online and on paper
8:59 .. Multiply Fractions...then pause video to TALK, THINK and DO online and on paper
10:06 .. Divide Fractions...then pause video to TALK, THINK and DO online and on paper
11:33 .. Patterning...then pause video to TALK, THINK and DO online and on paper
13:30 .. Area – A STEM activity...then pause video to TALK, THINK and DO online and on paper
14:10 .. Add 3 or 4 Numbers Vertically...then pause video to TALK, THINK and DO online and on paper
14:52 .. Word Problems – The Walker...then pause video to TALK, THINK and DO online and on paper
15:40 .. Discuss - TEACHING .. not TELLING...then pause video to TALK, THINK
16:19 .. MATH or MAGIC .. Ma & Pa...then pause video to TALK, THINK
18:50 .. The Learning Pit .. by James Nottingham...then pause video to TALK, THINK
30:56 .. The End

Step 6. Data Analysis .. a Video to display options will be released shortly.

On the RIGHT SIDE, "Introduction to Coding through Robotics"
Click on the turtle to open up samples of "Introduction to Coding through Robotics"
Marketing information will be added shortly.

Finally the text material above will help teachers, parents and students to understand and to use the video "Teach, don't Tell" at Step 5 under .. UMathX Training Videos .. effectively.

We have a Final Concern.
Anyone using the material explained on the website .. www.umathx.com made up of :

Step 1.Online Content
Step 2.Online 3 part lessons to help in implementation.
Step 3.Videos

… **must take time to think through and understand the multiple models and approaches and then consider which ones may work best with a certain student and/or groups of students.**

We have lessons within various models ready for you, the parent or the teacher but this is not a quick "sit and get". Please take the time. Please feel free to share your ideas.

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