Comparing Web Resources for Curriculum Development of Mathematics Education

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Abstract

The purpose of this paper is to make clear the teachers' needs and view points toward web resources in the Internet for developing their curriculum in mathematics education. In this purpose we planned to carry out two kinds of survey. The first survey is an investigation of math teachers' needs and the second one is comparing recommended math web sites. In result of first survey, it is suggested that math teachers (n=20, from 11 countries) sometimes use application software (e.g., Matlab, Mathematica, Statistica, Dr. Math and so on) for their teaching, and web resources for their curriculum development (e.g., Lesson Plans page, Everyday Mathematics Center, NICER and so on). In result of second survey (27 items for comparing), these sites have well structure 50%, worksheet 70%, dynamic and interactive sections 70%. Also, these sites have high rate in communication system like ML or Q&A nearly 70%. However, resources about lesson planning 20%, practical information and activities 20%, pre and post-test for each section 20% are in a low rate. These results might be useful for developing web resources in the field of mathematics education according to teachers' needs.

1. Introduction

Research in the late 1970s and early 1980s revealed that children have much richer and more active mathematical minds than had been suspected (Gelman and Gallistel, 1978; Gelman, 1982; resnick, 1983; Fuson & Hall, 1983; Gelman, Meck, & Merkin, 1986). They found that young children are capable of absorbing a great deal of new material, sometimes more rapidly than adults. During the 1980s, certain supposed constraints on what and when children could learn, hypothesized by Piaget and others, were shown to be artifacts of the research tasks and not truly indicative of the capabilities of children (Walsh, 1991).

Researchers working in the 1970s and 1980s showed that children often learn standard computational algorithms with very little understanding (brown & Burton, 1978; Van Lehn 1983, 1986). Other researchers found that the traditional approach to teaching computation engenders beliefs about mathematics that impede further learning (Hiebert, 1984; Cobb, 1985; Baroody & Ginsburg, 1986).

Different Methods in Math Teaching

In the early 1980s, the University of Chicago School Mathematics Project resource development component began studying mathematics education in the Soviet Union, Japan, China, and other high-achieving countries (Wirszup & Streit, 1987, 1990, 1992). Wirszup found that other nations were much more ambitious in the scope and sequence of mathematics covered. Even in arithmetic, textbooks in other countries presented topics earlier, had a consistent pattern of spaced practice with mixed operations. It is common knowledge that people "use a follow" different ways of collecting and organizing information into useful knowledge. Some learn best through interaction with their peers, others accomplish this through lone study and contemplation. Certain individuals, on the other hand, prefer to learn a skill by manipulating concert objects, watching,

listening, or by reading an instruction manual (Cross, 1976). Issues such as time constraints, lack of abundant resources, teachers' experience and so on, make it extremely difficult for any teacher to cater for these individual differences. This situation sometimes results in learning difficulties for some students. To address these, some teachers resort to more or less prescriptive teaching, where rules and the mechanics of teaching are followed. On the other hand, other teachers follow creative teaching, which approaches situations in an unparalleled way. Paul and Kathy (1990) distinguish between good learning and creative learning. They define creative learning as a natural healthy human process that occurs when people are curious and excited. Good learning, on the other hand, requires students to follow skills such as recognition, memory and logical reasoning, which are the abilities frequently assessed in tests of intelligence and scholastic aptitude (Paul & Kathy, 1990). However, these are abilities that are rarely developed in mathematics classrooms despite "good" teaching intentions. To promote these, mathematics should be viewed differently – as a science of pattern rather than as a set of rules. In this regard students should be given control over what they learn. They should be actively involved in the learning process for knowledge to be meaningful. It has been shown that students prefer to learn in creative ways rather than just memorizing information provided by a teacher or parents and that they also learn better and sometimes faster (Paul & Kathy, 1990).

How Computer Can Help Teachers?

Computer can assist teachers in developing a creative learning situation that takes cognizance of individual learning differences. Also, computer can empower and provide to students all the tools necessary for promoting creativity. There is no doubt that the greatest asset a teacher can have is to have access to computer because of its versatility. One of the most important things that preoccupy teachers' time is the preparation of presentable material for their classrooms. With the help of computers, the teacher can effectively address the challenge of organizing mathematics instruction in such a way that it attracts and develops the abilities of the greatest number of students possible (National Council of Teachers Mathematics NCTM, 2000).

With multimedia capabilities, computer has the capabilities of appealing to our eyes, ears, feeling and taste, and therefore, can widen and enrich the content and scope of our educational experiences. With this, the individual differences in learning style can be taken care of in an unparalleled way. With computer, students can visualize mathematical concepts which are different to comprehend without computer. In a typical classroom, computers provide easier and clearer illustrations than those a teacher would make.

As a matter of fact, there are relatively very few teachers that have the time or artistic talent to produce illustrations by "hand with chalk, overhead transparency pens, or making pens that can compete with those generated with computer" (Cangelosi, 1996:202), or even a graphics calculator. This can be seen in a case of three-dimensional objects for instance. Such objects are difficult to draw on the chalkboard and difficult for students to visualize by the students.

How Computer Can Help Students?

With the help of computer and graphics calculators, students themselves may creatively draw three dimensional objects, and also see different view of the object, thus saving teachers' precious and limited time as well as building concrete image of the object in students' minds.

Similarly, computers can give students a more self-reliant role in their own education, and make students become more active agents in their education, thus making students independent learners.

It has been shown that computer can simulate projects that teach students teamwork, problem solving, and critical thinking, as well as increasing their enthusiasm for learning. Also, computer give a student access to instructional programs designed with bigger resources, more expertise, and greater talent than can be found on a single campus. It can enrich and supplement classroom instruction that is already available. It can give a student alternative modes of instruction for the same subject.

Today's students will live and work in the twenty-first century, in an era dominated by computers, by worldwide communication, and by a global economy. Jobs that contribute to this economy will require workers who are prepared to absorbed new ideas, to perceive patterns, and to solve unconventional problems (Steen, 1989). Under this dispensation, there is no greater gift that a student and get from school than empowering him/her with the necessary tools to face this challenge. It

has been established that good use of computers can empower students to creative and critical thinkers, and better problem solvers (Kaput; 1992; Roblyer, 1989).

How to Promote the Skills of Teachers?

"Billions of dollars each year are invested in classroom technology, and the efforts for Net Day have wired thousands of classrooms and libraries. When these investments are coupled with ongoing teacher training and support, we believe they will have a significant impact on teaching and learning," said Brian L. Halla, National's Chief Executive Officer. "Our goal is to reach as many educators as possible, as quickly as possible, with the information, tools and resources they need to harness the power of the Internet and use it in the classroom. This technology brings endless possibilities and excitement to learning."

"My students are leveraging the Internet as a research tool and developing marketable skills at the same time," said Kathy Lincoln, a Lifeskills teacher at Chaboya Middle School in San Jose who recently completed the first phase of National's Internet training course. The course had helped her locating new tools easily that may have taken a longer time. These tools are "affordable and easily accessed or created" improving her ability to communicate with parents and students.

2. Purpose and research approaching

As we mentioned in the above, computer and internet technologies can enhance not only students' math learning but also teachers' skill learning.

The technology planning needs voice of the teachers in the classrooms. So for better understanding which kind of these planning are more necessary, we are going to make clear the teachers' needs and view points toward web resources "of" internet for developing their curriculum in mathematics education. In this purpose we planed to carry out two kinds of survey. The first survey is investigation of math teachers' actual needs and the second one is comparing 10 main math web sites according to teachers' needs that we gained in the first investigation.

3. Survey about Computer Usage in Mathematics

At first we made an online survey in order to find the math teachers' actual needs. There are 27 items that we divided in four parts, "Face sheet", "Computer knowledge in math teaching", "How use web resources" and "What kind of web content is useful". After we made an online-survey system by CGI we sent E-mails that request to answer by three ML (i*EARN, Schoolnet and JSME) in limitation of three weeks. Finally we received 20 data from 11 countries. (Table1) Twenty teachers 40% male and 60% female, who teach in K-12 grades and upper, replied our online-Survey.

Table 1. The countries whose teachers submitted the online-Survey

Country	count	Percent
Australia	1	5.0%
Bostwana	1	5.0%
Canada	1	5.0%
England	1	5.0%
Iran	5	25.0%
Japan	4	20.0%
Nigeria	1	5.0%
Russia	2	10.0%
Tanzania	2	10.0%
Uganda	1	5.0%
USA	1	5.0%

n=20

By a glance to the Table2 it can be recognized the most users of computers are high school teachers. It shows an online survey for promoting the quality of sites and knowledge is very important for high school teachers and they want to find new ways in the methods of their teaching and they are willing to share their needs with others to solve those problems.

Table 2. The grade of teachers who teach Mathematics

Grade	count	Percent
Elementary	3	15.0%
Junior high school	2	10.0%
High school	12	60.0%
University	3	15.0%

n=20

First part is about what kind of computer knowledge the teachers use in their mathematics teaching. As Table 3 shows, the top knowledge categories are word processing application 40%, Internet application 40%, and communication application 45% but algorithmic ways of thinking (flowchart) and programming has less usage. However graphic, spread sheet and mathematics application have normal rate. For example the contents that teachers sometimes used are Matlab, Mathematica, Minitab, Graphical, Maxilla, Analyze Data, Fire Fox (a browser), Excel, Statistica, Dr. Math. So teachers prefer to use prepared than to use applications software.

Table 3. The knowledge which mathematics teachers use in their teaching (Multiple Answer)

Computer knowledg in Math teaching	Daily(5)		Always(4)		Sometimes(3)		Seldom(2)		Never(1)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
word processing application	8	40.0%	5	25.0%	1	5.0%	4	20.0%	2	10.0%
flowchart	1	5.0%	2	10.0%	3	15.0%	7	35.0%	7	35.0%
programming language	0	0.0%	1	5.0%	2	10.0%	7	35.0%	10	50.0%
Database aplication	2	10.0%	0	0.0%	7	35.0%	8	40.0%	3	15.0%
Spreadsheet application	3	15.0%	4	20.0%	7	35.0%	2	10.0%	4	20.0%
Graphic application	3	15.0%	4	20.0%	3	15.0%	2	10.0%	8	40.0%
Internet application	8	40.0%	2	10.0%	4	20.0%	4	20.0%	2	10.0%
Communication application	9	45.0%	2	10.0%	3	15.0%	4	20.0%	2	10.0%
Mathematics application	3	15.0%	1	5.0%	9	45.0%	4	20.0%	3	15.0%

n=20

In the second part it is asked how web resources can develop the curriculum? Table 4 shows that 50% of teachers use computer for finding topics that are unknown for them, 40% for finding good exercises and 55% search for finding samples in animations. So obviously the teachers need new knowledge in details and good exercises and good samples in animation.

Table 4. The ways of usage resources by mathematics teachers for curriculum development (Multiple Answers)

How use Web Resources	Daily(5)		Always(4)		Sometimes(3)		Seldom(2)		Never(1)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
PDF question sheets	3	15.0%	3	15.0%	9	45.0%	2	10.0%	3	15.0%
Search topic which is unknown	0	0.0%	8	40.0%	10	50.0%	0	0.0%	2	10.0%
Finding good exersises	1	5.0%	7	35.0%	8	40.0%	1	5.0%	3	15.0%
Find sample in animation	0	0.0%	2	10.0%	11	55.0%	5	25.0%	2	10.0%
Disscuss in site's forum	3	15.0%	0	0.0%	7	35.0%	5	25.0%	5	25.0%
Find some puzzle or game	1	5.0%	3	15.0%	9	45.0%	4	20.0%	3	15.0%

n=20

Finally by the third part math teachers were asked what kind of contents of the website they think is useful (see Table 5). If in this table we add the first column and second column together, we can have this results that 80.0% of Math teachers believe a math site should be dynamic and interactive, 75.0% said it should be free, 70% wanted the sites be well structured “and engage the students in challenging for learning mathematics,” 65% ask for facilities to contact with students, more explanation in details, teaching the software in the web site and having project and presentation, and 45% discussion with specialist is not as much as important the other part.

Table 5. The contents that mathematics teacher think are useful (Multiple Answers)

what kind of web content is useful	Very much(5)		very(4)		Middle(3)		A little(2)		less(1)	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
lesson planning in K-12	5	25.0%	9	45.0%	3	15.0%	3	15.0%	0	0.0%
well structured	8	40.0%	6	30.0%	5	25.0%	1	5.0%	0	0.0%
Dynamic and interactive	7	35.0%	9	45.0%	3	15.0%	0	0.0%	1	5.0%
printable worksheet	4	20.0%	11	55.0%	3	15.0%	1	5.0%	1	5.0%
free access	7	35.0%	8	40.0%	5	25.0%	0	0.0%	0	0.0%
ability to contact students	8	40.0%	5	25.0%	5	25.0%	1	5.0%	0	0.0%
explanation in details	5	25.0%	7	35.0%	7	35.0%	1	5.0%	0	0.0%
contain software training	6	30.0%	7	35.0%	4	20.0%	1	5.0%	2	10.0%
engaged the students in challenging mathematics	11	55.0%	3	15.0%	4	20.0%	0	0.0%	2	10.0%
projects and presentations	6	30.0%	7	35.0%	6	30.0%	0	0.0%	1	5.0%
discossion with specialists	5	25.0%	4	20.0%	8	40.0%	2	10.0%	1	5.0%

n=20

We gained some opinions from teacher as follows:

Comments from Tanzania: "Actually it is difficult because our school does not have the computers. Not only that but also even the lack of knowledge for computer uses, mostly the internet cafe are located in towns, one have to pay for the internet service hours. So, it becomes difficult for many teachers and pupils to make use of Internets and get the information from the computers. The ability to contact to students is very important, the web content may be detail but if does not deriver the intent content is nonsense. It should also be free especially in the zone of the developing country so as we can much together in globalize the world. The students engagement it also good challenge for them to participate, competition can also be the motor behind their challenge."

Comments from Nigeria: "It depends on the seriousness of the students to their academics, those that have a focus are usually very interested, and those that are slow learners are usually less interest."

Comments from Russia: "News in Mathematics, Problems and modern tasks which need original solution Information about Grants is necessary on a site."

From the above results, it is suggested that mathematics teachers sometimes use application software for their teaching, and web resources for their curriculum development. However, they never use programming language for creating new resources. This means mathematics teachers want to get useful resources in an easy way without difficult processing.

4. Comparing Math Sites

View of Points for comparing.

The second survey created by the results of the first survey. The concretely by the results of first survey teachers recommended some math sites. So we did pre-observation on those sites by 11 items in table5 in order to improve the items for comparing. In result, we found 16 extra items and at whole by 27 items we did re-observation on 10 sites. Those items could be divided in three parts, knowledge, communication and facilities.

How to plan for teaching

1. Lesson plans
2. Well structure & arrangement
3. Worksheets
4. Practical information & activities
5. Video-streaming of workshops
6. After school programs and activities
7. Dynamic & Interactive
8. Pretest and post test for each section
9. Writing information in details

Communication

10. Teacher and students discussion
11. contact with students by ML
12. Inspired teachers to check the questions
13. Problem with solve
14. Questions and response
15. Olympiad Q & A and teaching
16. Training Materials
17. Teaching software
18. Science projects depends on math

Facilities

19. FREE resource
20. Free download software
21. The text books which teach in schools
22. Printable resource educations
23. Translating other countries' text books
24. International Language(English)
25. Researcher in site area
26. Library
27. Link to the other schools as a partner

Outline of math sites that were recommended

The contents of math site that were recommended in the survey are summarized as follows:

Lesson Plans page

http://www.lessonplanspage.com/Math.htm

The Lesson Plans Page is a collection of over 3,000 lesson plans from Preschool through High School and beyond, that were developed by Kyle Yamnitz, students and faculty at The University of Missouri, and more recently by the users of this website. Launched in October of 1996, The Lesson Plans Page was developed to assist educators of all types. Elementary school teachers get lesson plans that are ready to use in their classrooms. College students get great example lesson plans or ideas to base their own lesson plans on. Home schoolers can get lesson plans to use at home and parents can get ideas for educational activities to use with their children.

This site has teacher discussion, search, inspired teachers, science projects, math worksheets.

Education World

http://www.educationworld.com/

This site is an educational Web sites only, a place where including lesson plans, practical information for educators, information on how to integrate technology in the classroom, and articles written by education experts; site reviews; daily features and columns; teacher and principal profiles; Wire Side Chats with the important names in education, The Education World team produce this site FREE for educators.

ISOTILES Workbook

http://www.isotiles.com/workbook/index.htm

This work book may be used directly from a PC, or you may prefer to present the ideas verbally, following the guidance given here. You may also copy any of the pages, printed or as overhead projector slides, provided that you use them with actual Isotiles®. This site is only geometry samples with shapes. Problem with solve of those by clicking.

Educator's Resource Desk

http://www.eduref.org/cgi-bin/lessons.cgi/Mathematics

The Educator's Reference Desk provides access to the following resources: Resource Collection - Links to over 3000 resources on a variety of educational issues. This collection includes Internet sites, educational organizations, and electronic discussion groups. The Lesson Plan Collection contains more than 2000 unique lesson plans which were written and submitted by teachers from all over the United States. Question Archive: A collection of over 200 responses to popular questions on the practice, theory, and research of education is available. These responses may include citations from the ERIC database, Internet sites, discussion groups, and/or print resource information.

The National Information Center for Educational Resources

http://www.nicer.go.jp/

This site is a central website providing all kinds of information on educational resources in Japan. It also provides various kinds of support systems for Learners and educations. This site is only in Japanese Language. To provide the most appropriate information for each user, the NICER presently classifies information into the following six categories: Elementary School, Junior High School, High School, Teacher Higher Education, Life long. Some parts of Mathematics can be observed, it

collected just as title not as lesson planning but at whole for observing the information it should be submitted.

Everyday Mathematics Center

http://everydaymath.uchicago.edu/

The University of Chicago School Mathematics Project (UCSMP) was founded in 1983 with the aim of upgrading mathematics education in elementary and secondary schools throughout the United States. UCSMP It has created a curriculum for students from kindergarten all the way through 12th grade. They emphasize reading, problem-solving, everyday applications, and the use of calculators, computers, and other technologies. Its studies indicate curriculum. UCSMP has also engaged in a wide range of other activities, including the development of training materials for both elementary and secondary school teachers, and the translation of textbooks and educational literature from foreign countries such as the Soviet Union and Japan.

Roshd National Schoolnet of Iran

http://daneshnameh.roshd.ir

This site is in Farsi Language and free it contains Olympiads, Teaching 44 software and download some of those, Teaching how to type, information about future job for students, Link of all schools in 28 prefectures of Iran in this site, archive for questions and answers, The school books and teachers' guide books all PDF files, forum, and different branches of Mathematics, relation between other science and Mathematics and the problems in that field, information about the ancient mathematicians young mathematicians, the thesis of students in Universities about mathematics, the history of Mathematics, introducing the young mathematicians who are success.

Panhandle Area Educational Consortium

http://www.paec.org/teacher2teacher/

Over the past two years, the U. S. Department of Education has brought together some of the nation's most effective teachers and practitioners to share the research-based practices and data analysis to make a difference in student achievement. During this time, these educators have shared their expertise through the U. S. Department of Education's Teacher-to-Teacher Workshops. These workshops were taped and made available nationwide over this Web site through a special contract. This password-protected system provides a personal portfolio so that participants can track and manage their professional development activities. The portfolio is updated after a participant completes a Teacher-to-Teacher course and is used to track additional professional development activities.

Learning Point associates

http://www.ncrel.org/tandl/homepg.htm

Learning Point Associates has received a grant from the Charles Stewart Mott Foundation to collect high-quality complementary learning activities and innovative after school programs. The purpose of this technical assistance is to enable teachers to select and successfully implement instructional strategies in mathematics that target student performance in a variety of settings. A combination of workshops and coaching can help a facilitator meets with small groups of participants and individuals and build strategies into daily lesson planning. This site is like a e-shop to introduces the useful products for teaching and learning.

The Math Forum

http://mathforum.org/

The Math Forum in English is a leading center for mathematics education operating under Drexel's School of Education, its mission is to provide resources, materials, activities, person-to-person interactions, and educational products and services that enrich and support teaching and learning in an increasingly technological world. Its online community includes teachers, students, researchers, parents, educators, and citizens at all levels that have an interest in math education. Through the growing collection of mailing lists, Web-based discussion areas, and ask-an-expert services, it has given places to talk, to reach others with similar interests, and to find answers to burning questions. The Forum's volunteer 'math doctors' and the archive of answers will help users with their math questions. The Problems of the Week (PoWs) provide creative. The archived ESCOT Problems provide interactive challenges for middle and high school students. Want to use or develop educational technology? There is Math Tools, the Forum's community, digital library and development of software for mathematics education.

Result of Comparing Sites

We are going to find the best points of sites and develop a site with nearly most of those high rate points. From Table6 it can be recognized that lesson planning 20%, practical information and activities 20%, Video streaming of workshops 20%, after school programming and activities 40%, pre-test and post-test for each section 20% is in a low rate of products and according to the result of survey from Mathematics teachers, we saw they are willing to use more lesson planning, the activities who encourage students for challenge in Mathematics solving so for some of the countries which conquer is very important pre-test and post-test according lesson planning is necessary. So in the other hand these sits have well structure 50%, worksheet 70%, Dynamic and interactive sections 70% and writing information in details 60%. It shows they try to attract teachers and students. Of course if they know the main needs of them they do their best to have a very useful site.

Table6. View of point in Communication

Site / ViewPoint	Lesson Plan Page	World Education	ISOTILES	Educator's Reference Desk	NICER	Everyday Mathematics	ROSHD	PAEC	Learning Point	The Math Forum
Lesson Planning	✔			✔						
Well structure & arrangement Index	✔	✔		✔	✔	✔	✔			✔
Worksheet	✔	✔	✔	✔						✔
Practical information & activities								✔		✔
Video-streaming of workshops				✔					✔	
After school programs and activities	✔	✔		✔	✔					
Dynamic & interactive	✔	✔		✔	✔	✔	✔			✔
Pretest and post test for each section	✔						✔			
Explanation in details	✔	✔	✔		✔		✔			✔

From Table 7 it can be recognized that contact with students by ML 40%, Olympiads Q & A and teaching higher knowledge 10% and teaching software only 10% is very low rate and according to the survey of Mathematics teacher we found “contact with students and new knowledge and higher education was asked by teacher of course if they know how to use a software their eagerness to use of that in their lesson planning will increase”. These sites have high rate in, teacher and students discussion 90%, inspired teacher to check the questions 70%, problem with solve 60%, Questions and response 90%, training materials 70%, and Science project depends on math 80%. So in communication nearly 70% of items are active and their aims completely are according what teachers needs.

From Table 8 it can be recognized that only 10 % of these sites have free download software and textbooks which can be used to teach in schools and 20% translated some of the other countries’ textbooks on their sites. And 70%-80% of those are free with printable resources, have English version and link to the other schools. But 50% of math sites don’t have any library.

According to the survey if they could easily access to the useful software they could promote their ability in the usage of software.

Table 7. Communication facilities

Site / ViewPoint	Lesson Plan Page	World Education	ISOTILES	Educator's Reference Desk	NICER	Everyday Mathematics	ROSHD	PAEC	Learning Point	The Math Forum
Teacher and students discussion	✔	✔		✔	✔	✔	✔	✔	✔	✔
Contact with students by ML		✔		✔			✔			✔
Inspired teachers to check the questions	✔	✔		✔	✔	✔	✔			✔
Problem with solve	✔	✔	✔		✔		✔			✔
Questions and response	✔	✔		✔	✔	✔	✔	✔	✔	✔
Olympiads Q&A and teaching							✔			
Training materials	✔			✔	✔	✔	✔		✔	✔
Teaching Software						✔	✔			
Science projects depends on math		✔	✔	✔	✔		✔	✔	✔	✔

Table 8. Facilities of websites

Site / ViewPoint	Lesson Plan Page	World Education	ISOTILES	Educator's Reference Desk	NICER	Everyday Mathematics	ROSHD	PAEC	Learning Point	The Math Forum
Free			✔	✔	✔	✔	✔	✔	✔	✔
Free download software							✔			
The text books which teach in schools							✔			
Printable resource educations	✔				✔	✔	✔	✔	✔	✔
Translated other countries' text books	✔	✔								
International Language(English)	✔	✔	✔	✔		✔		✔	✔	✔
Link to the other schools as a partner		✔	✔	✔		✔		✔	✔	✔
Reserchers in site area	✔	✔	✔	✔	✔		✔		✔	✔
library	✔					✔	✔		✔	✔
Link to other useful sites		✔	✔	✔		✔		✔	✔	✔

5. Conclusions

Combining the two surveys, "Online survey for understanding the needs of Mathematics teachers in their teaching" and "comparing 10 Mathematics sites" we could recognize which kind of sites are more useful and if anyone decided to start a new math site, they can consider all necessary features in making it a useful web site for teachers. Specially "the low rate items in these by using good web sites teachers can develop" curriculum and choose the best one among other curriculums.

As Kathy Lincoln said after she completed the internet training course she could get to know several new tools that can be easy accessed or created. So it is crucial to train teachers in the use of computers in teacher development programs. It could be useful in our next step to find out what teachers would do if web sites are created by them.

Of course, in the responses from teachers one may have echoed the needs in some countries are simply to have computers (not even one for some at this time) and the access to internet (for some, it remains to be very expensive). So maybe some action plan is needed to investigate "how some of countries can acquire and prepare free facilities for schools." That, no doubt, will involve the full participation of Ministries of Education, or equivalents in most countries.

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