

Revised
2009/0093**Cultivating Active Learner in Mathematics Learning Community****Tak Sun Secondary School****Introduction**

School curricula are designed to motivate every student to learn in various environments (school, home, community), minimize or remove practices that de-motivate students by using a range of diverse and appropriate strategies "Learning to Learn - The Way Forward in Curriculum" (2001). The "Basic Education Curriculum Guide - Building on Strengths (Primary 1 - Secondary 3)" (2002) further emphasizes that schools should adopt different approaches to suit the capabilities of students, motivate students with different levels of performance and use appropriate learning and teaching strategies to address the needs of students with different learning styles. With regard to the direction of mathematics education in junior secondary, teachers should use diversified learning activities and tools (including project learning and the use of information technology) to arouse students' interest in learning mathematics and to foster high order thinking skills. Moreover, teachers should adapt the mathematics curriculum to cater for learner differences and use curriculum space created flexibly for consolidation and enrichment.

There should be exchanges and sharing of experience in the learning and teaching of mathematics among teachers, school administrators, curriculum developers and academics. Communication between primary and secondary schools should be reinforced. Moreover, student diversities are a key issue in quality mathematics learning. Supporting measures for both ends of the students' population are equally essential. The curriculum should be adjusted and adapted to meet the needs of less able and more able students.

Therefore, we would like to propose a project in which our students will have chances to learn mathematics in different environments by taking part in various activities. Such environments and activities are set up for their learning differences. At the end of the day, we hope to build up a mathematics learning community where teachers and students could constantly and actively be engaged in dialogue, sharing ideas and enhancing skills that will lead to the establishment of a Quality Education at our school.

Revised
2009/0093**Objectives**

Derived from the concept mentioned in the introduction, the aim of this project is to enable students to cope confidently with the mathematics needed in their future studies, workplaces or daily lives in a technological and information-rich society. The objectives include:

1. bridging the mathematics learning from CMI to EMI and primary to secondary;
2. building a learning community at school by different types of interesting programmes;
3. motivating students with different levels of performance;
4. catering for the needs of less able and more able students;
5. arousing students' interest in learning mathematics.

Targets and Beneficiaries

The project targets all junior form students and some senior form students in 2009/2010 and 2010/2011 academic year.

The programmes and activities outlined in the action plan are complimentary to the classroom teaching and can enhance the learning outcomes as a whole.

Action Plan

Activities and programmes listed below will be held to help students develop the capacity to learn how to learn mathematics. They will also cater for the different needs of the students, thus arousing the students' interest and building our culture of learning mathematics.

What and how can the students learn?Learning by Games

A bridging programme will be organized to help new Form 1 students learn mathematics in English. Student-centred activities and fun games will be introduced to arouse the students' interests to learn mathematics in order to establish an active learning culture at our School.

On the other hand, students can play some mathematics games during the consultation service and during lunch time.

Learning from Competitions

Competitions will be held in each class during lesson time that is assessing their learning in each topic. Besides, inter-class competitions will also be organized to build their class spirit in learning mathematics. These competitions are also methods to monitor the continuous progress of the students in learning each mathematics topic.

Students are selected to join the elite training courses, after which some students will be selected to join some external mathematics competitions.

When will the students learn?Learning during class time

Traditional teaching is still one of the main teaching and learning methods in the classroom. Student-centred learning should be encouraged. In the project, students will be encouraged to express their ideas and questions during class time. Teachers will mainly act as facilitators to assist the students to learn effectively. Some extra equipment that can help students learn will be purchased. As a result, an active learning environment will be established inside the classrooms.

Learning at leisure

The corridor on the third floor will be decorated to display the wonderful world of mathematics to our students beyond the textbooks. The topics will be changed to help our students know more about mathematics, including the beauty of mathematics, interesting stories of mathematics, mathematicians, and so on. Some activities, such as game booths and small quizzes, will be organized to help students familiarize with the contents of displays and

Revised
2009/0093

promote mathematics in order to arouse students' interest in mathematics. Students can play an active role in designing, decorating and organizing the materials and activities in this event.

Senior form students act as role models to empower junior form students to realize their potentials. The Mathematics Magazine, Café Mathematics, will be edited by our senior form students to arouse their interest in independent learning. Higher achievers in junior form will try to write some interesting topics in mathematics to share their own views of mathematics with others. Other students can learn mathematics outside the classroom by reading these magazines. The Mathematics Magazine, Café Mathematics, is also another way to promote mathematics at leisure. Learning from reading is a good way for students to learn mathematics outside the classroom at any time.

Who will get involved in the project?

Learning from Peers

Students can help one another in the learning process. We will prepare some interesting problem sets for discussion during the consultation service. Problem solving skills, creativity, collaboration skills and communication skills will be trained in the discussion.

In junior form, students will be encouraged to come out to present their ideas and solutions to the mathematical problems and group discussion will often happen during lessons to build a good sharing environment among students. Some class work will be presented at once by a visualizer to point out the common mistakes and appreciate the good work from the students to help them learn from their peers.

The Mathematics Magazine, Café Mathematics, will be edited by our senior form students to arouse their interest in independent learning. Other students can learn mathematics outside the classroom by reading these magazines.

Learning from Teachers & The coordinator

Apart from the normal lesson time, all students can learn from teachers and the coordinator during the consultation service every day. Students can seek help after school and teachers and the coordinator are always ready to solve the students' difficulties in mathematics. An active learning environment can also be formed at school to create a good learning culture at school.

Other than attending the consultation service, higher achievers will be invited to join elite training courses to learn advanced mathematics knowledge from both the coordinator and teachers. Some of them will be selected to take part in some inter-school mathematics competitions.

Revised
2009/0093

The details of the programmes are as follows:

Programme	Period	Persons In-charge
<p>Consultation service: Objectives 2, 3, 4 and 5</p> <ul style="list-style-type: none"> ➤ Teachers and the coordinator are employed as mathematics subject counselors to help students in need to solve their mathematics problems after school every day. ➤ Less able students can learn mathematics individually with the coordinator. Some supplementary exercises will be prepared to cater for different learning needs. ➤ It is also a good place for students to play some mathematics games such as Rummikub joyfully to train their logical thinking and to talk about some mathematics issues in small group to arouse their interests in mathematics. 	September, 2010 – June, 2011	Mr. Jason Cheung Mr. Ronald Hui Project Coordinator <hr/> Beneficiaries All students
<p>Elite Training Course: Objectives 3 and 4</p> <ul style="list-style-type: none"> ➤ Elite training courses will be organized every week after school to provide a very good opportunity for higher achievers to learn more about mathematics in each form. ➤ Teachers and the coordinator, as lecturers, will be employed to help in the courses. ➤ The higher achievers, selected by internal competition and good mathematics subject examination results, will be invited to attend the training courses to train their problem-solving skills, creativity and critical thinking skills. ➤ Some selected higher achievers will also participate in some inter-school mathematics competitions. 	September, 2010 – June, 2011	Mr. Eric KY Wong Mr. Ricky Chan Project Coordinator <hr/> Beneficiaries Selected mathematics higher achievers

Revised
2009/0093

Programme	Period	Persons In-charge
<p>Corridor Decoration & Events: Objectives 2 and 5</p> <ul style="list-style-type: none"> ➤ Some fixed displays will be fixed on the wall of the corridor outside classrooms on the third floor. ➤ Some posters will be displayed on the wall to share the mathematics world with our students beyond the textbooks. ➤ The topics of the displays will be changed to help our students know more about the beauty of mathematics, interesting stories of mathematics, mathematicians, and so on. ➤ Some activities, such as game booths and small quizzes, will be organized to help students familiarize with the contents of displays and promote mathematics in order to arouse students' interest in mathematics. 	September, 2010 – June, 2011	Mr. CJ Lam Mr. Alan Ng Project Coordinator Beneficiaries All students
<p>Mathematics Magazine: Objectives 2 and 5</p> <ul style="list-style-type: none"> ➤ The Mathematics Magazine, Café Mathematics, will be edited by our senior form students to promote mathematics on campus. ➤ Lunch talks will be organized to present some interesting topics to students. ➤ The magazine, which will be published in May 2010, will be distributed to our students and schools that are interested in it to promote mathematics outside classrooms and textbooks in Shatin and Ma On Shan. ➤ Higher achievers in junior form will try to write some interesting topics in mathematics in the second term and we will produce another booklet written by junior form students to show their own mathematics worlds to others. The booklet will be published in October 2010. ➤ We will supervise some students to produce some outstanding passages to participate in inter-school competition. 	September, 2010 – June, 2010	Mr. Sum Wong Mr. Ronald Hui Project Coordinator Beneficiaries All students and schools in Shatin and Ma On Shan

Revised
2009/0093

Programme	Period	Persons In-charge
<p>Effective grouping with related actions: Objectives 2, 3, 4 and 5</p> <ul style="list-style-type: none"> ➤ Less able students will be encouraged to come out to present their ideas and solutions to the mathematical problems. ➤ Students will also be divided into small groups to learn and discuss with peers. ➤ Teachers will act as facilitators to discuss mathematics with each group of students and provide guidance in the process. ➤ Some class work will be presented at once by a visualizer to point out the common mistakes and appreciate the good work from the students, which is the effective way to help them memorize the rules and steps in manipulation. ➤ These actions will be done to encourage students' participation, building their confidence and enhancing collaborative learning. 	<p>September, 2010 – June, 2011</p>	<p>Mr. Davy Tsoi Mr. Dennis Law Project Coordinator</p> <p>Beneficiaries All Form 1 and Form 2 students</p>
<p>Learning Mathematics in English with Fun: Objectives 1 and 5</p> <ul style="list-style-type: none"> ➤ This programme provides a good chance for students to experience learning mathematics in English. ➤ The targets are our Form 1 boys in the 2010 – 2011 academic year. ➤ Numbers, fractions, shapes and statistics will be taught in this programme. ➤ Student-centred activities and games will be introduced to arouse the students' interests and to experience mathematics with fun in order to establish an active learning culture in their own hearts and at our school. 	<p>June, 2010 – September, 2010</p>	<p>Mr. Davy Tsoi Mr. Dennis Law Project Coordinator</p> <p>Beneficiaries All Form 1 students</p>

Revised
2009/0093

Programme	Period	Persons In-charge
Internal and External Competitions: Objectives 3 and 5 ➤ Competitions in groups in each class will be organized during lesson time after the learning of each topic to assess the progress of their learning. ➤ Inter-class competitions will also be organized to build up their class spirit in learning mathematics. ➤ The inter- and intra- competitions will be also a good and continuous method to monitor the progress of the students in learning mathematics in each topic. ➤ After the elite training courses, some students will be selected to join some external mathematics competitions to make a name for themselves.	September, 2010 – Aug., 2011	Mr. Eric KY Wong Mr. Jason Cheung Project Coordinator
		Beneficiaries All Form 1 and Form 2 students and mathematics higher achievers

Nine generic skills will be promoted and learnt in the programmes.

Generic Skills	Learning from Teachers & The coordinator	Learning from Peers	Learning in classrooms	Learning at leisure	Learning by Games	Learning from Competitions
Communication Skills		✓	✓		✓	
Creativity	✓	✓		✓		✓
Critical Thinking Skills	✓					✓
Problem-solving Skills	✓	✓	✓	✓		✓
Collaboration Skills		✓	✓	✓		
Numeracy Skills	✓	✓	✓	✓	✓	✓
Information Technology Skills		✓	✓	✓		
Self-management Skills	✓					✓
Study Skills	✓	✓			✓	✓

Revised
2009/0093**Collaboration among Mathematics Subject Teachers and the Project Coordinator**

Collaboration among Mathematics subject teachers and the project coordinator does always happen to make the project smoothly implemented. Meetings will be held in this project to

1. prepare the materials for the programmes
2. monitor the progress of the programmes
3. evaluate the students' performance
4. share and exchange the professional experience among teachers and the coordinator

Project Coordinator's Roles

The project coordinator will play a key role in making this project successful. He will handle all the administrative work, prepare the learning materials for the courses, format and enrich the magazine, organize the internal competitions, act as a tutor and trainer in the consultation service and the training courses and assist in the lessons of this project. The jobs in this project are as follows:

1. Prepare the supplementary exercises and materials (consultation service)
2. Supervise and help the students every day after school (consultation service)
3. Teach the higher achievers (elite training courses)
4. Prepare the learning materials (elite training courses)
5. Help and lead the students to participate in external competitions (elite training courses & Internal and External Competitions)
6. Supervise the construction of the corridor decoration (corridor decoration & events)
7. Design the posters (corridor decoration & events)
8. Prepare and organize the related learning activities (corridor decoration & events)
9. Help the students prepare for their passages (Mathematics Magazine)
10. Format and edit the magazine (Mathematics Magazine)
11. Handle the administrative work such as printing (Mathematics Magazine)
12. Prepare in-class competitions (Effective grouping with related actions & Internal and External Competitions)
13. Prepare inter-class competitions (Effective grouping with related actions & Internal and External Competitions)
14. Prepare the learning materials (Effective grouping with related actions)
15. Prepare the learning materials and related games (Learning Mathematics in English with Fun)
16. Conduct and organize the learning activities (Learning Mathematics in English with Fun)
17. Record the information and evaluate the progress of programmes

Revised
2009/0093

Expected Products, Deliverables and Outcomes

Products:

1. Mathematics Magazine: Café Mathematics (Prepared by senior form students)
2. Mathematics Magazine (Prepared by junior form students)
3. A series of teaching and learning materials
4. A set of EMI mathematics bridging learning materials for Form 1 students

Outcomes:

1. Students are motivated in learning mathematics and become active learners.
2. Active learning culture is formed in the school.
3. Culture in professional sharing among teachers is formed in the school.

Revised
2009/0093

Budget		
Category	Budget	Remarks
Staff Cost	\$211,050	
➤ Project Coordinator (\$13400 x 1.05 x 15 months)	\$211,050	
Equipment	\$33,700	
➤ Corridor Decoration	\$1,000 x 20 \$800 x 4	Wall Mounted Fixed Display Boards Posters
➤ 3 Visualizers	\$3,500 x 3	
General Expense	\$40,600	
➤ Consultation service ◆ Learning Materials & Games	\$2,000	e.g. Magazine, Reference books, Maths- related board games or card games, etc.
➤ Advanced Mathematics Training Course ◆ Teaching and Learning Materials	\$2,000	e.g. Printing, Reference books, Teaching and learning aids such as models, etc.
➤ Corridor Decoration & Events ◆ Learning activities related to the content of the corridor posters	700 x 4	e.g. Prizes and gifts, materials for running the activities, etc.
➤ Mathematics Magazine ◆ Printing Cost for Senior Form Magazine	\$12 x 1200	
◆ Printing Cost for Junior Form Magazine	\$12 x 1200	
➤ Learning Mathematics in English with Fun ◆ Learning Materials	\$2,000	e.g. Prizes and gifts, Teaching and learning aids, etc.
➤ Internal and External Competitions ◆ External Competition Application Fees	\$2,000	
◆ Internal Competition Preparation Expenses	\$10,00	e.g. Prizes and gifts, materials for running the competitions
Contingency	\$2,000	
TOTAL	\$287,350	Rounding up to hundred dollars (\$287,400)

Revised
2009/0093

Asset Usage Plan

Category	Item/Description	No. of Units	Total Cost	Proposed Plan for Deployment
Others	Wall Mounted Fixed Display Boards	20	\$20,000	Display boards will be mounted on the third floor of our school for promoting and displaying mathematics subject related events and materials.
Others	Visualizers	3	\$10,500	Visualizers will be placed in our school general office for lending. Teachers can borrow the visualizers for their lessons.

Report Submission Schedule

My school commits to submit proper reports in strict accordance with the following schedule :

Project Management		Financial Management	
Type of Report and covering period	Report due day	Type of Report and covering period	Report due day
Progress Report 1/6/2010 - 31/05/2011	30/6/2011	Interim Financial Report 1/6/2010 - 31/05/2011	30/6/2011
Final Report 1/6/2010 - 31/08/2011	30/11/2011	Final Financial Report 1/6/2011 - 31/08/2011	30/11/2011

Revised
2009/0093**Evaluation Criteria and Assessments**

In this project, many programmes will be launched, such as consultation service, elite courses, competitions, magazines and some fun packed activities and events. An evaluation will be done on each programme with the following means:

1. Students' feedback
2. Number of participants
3. Results of the competitions
4. Students' academic results
5. Teachers' feedback

After completing the project, we hope that there will be washback positive effects on our students to arouse their interest in mathematics so that they can build up their confidence to learn mathematics. Moreover, active participation in the events and activities can help our students learn at their own pace. Results of the competitions and students' academic results will probably be improved

Hopefully the following benchmark will be achieved:

1. In student survey, we can get at least 3.5 out of 5 in overall grade
2. In teacher survey, we can get at least 3.5 out of 5 in overall grade
3. In the external competitions, students can win prizes.
4. There are at least 5 participants in consultation service everyday.

Sustainability of the Outcomes of the Project

In this project, preparing materials, organizing the programmes and handling all the administrative work are done by teachers and the project coordinator.

After the completion of the programmes, all learning materials will have been prepared and the construction work will have been done. Related activities will be launched from time to time to arouse students' interests in mathematics every year. The new senior secondary students (NSS) will also help us continue the programmes as big brothers at School to build up the good culture in learning mathematics.

However, all the materials produced in the project can be reused and all the programmes can be rerun for many years. The achievements in organizing the programmes and administration can be shared among office staff, teachers, students and parents at our School. Besides, the cost of the project mainly covers materials and installation and the salary of the project coordinator. In subsequent years, when the project will be rerun, our school can

Revised
2009/0093

pay for the cost of the printing and the publication of the magazines. Therefore, the project will continue for several years and benefit greatly to more and more students in our school.

Dissemination/ Publicity Methods

The details of the project will be disseminated in the following ways:

- products developed in this project will be uploaded to our school web site for online access for the public;
- the published magazines will be shared with other schools in the community;
- sharing sessions will be organized to disseminate the results and difficulties encountered in the project among teachers of other schools and stakeholders.

Project Team Members

- Mr. Sum Wong (Master of Mathematics Subject Steam)
- Mr. Alan Ng
- Mr. C.J. Lam
- Mr. Davy Tsoi
- Mr. Dennis Law
- Mr. Eric KY Wong
- Mr. Jason Cheung
- Mr. Ricky Chan
- Mr. Ronald Hui
- Project Coordinator (To be hired by the project)

References

Learning to Learn - The Way Forward in Curriculum. Hong Kong: The Curriculum Development Council, 2001.

Basic Education Curriculum Guide - Building on Strengths (Primary 1 - Secondary 3). Hong Kong: The Curriculum Development Council, 2002.