Project Details

(I) Goals and Objectives

A team of teachers from five departments will achieve the following goals and objectives in this project.

Goals:

(a) To develop a series of F.1-3 learning packages for five key learning areas: English, Chinese, Mathematics, Integrated Humanities and Integrated Science.

(b) To develop IT skills for students and teachers to use electronic interactive whiteboard for the learning and teaching in our school.

Objectives: At the end of this project, the following skills of students would be enhanced

(a) Generic Skills: -Independent enquiry studies
  -Thinking skills
  -Collaborative interactive learning

(b) Technology Skills: -IT skills in learning

(II) Needs Assessment and Applicant's Capability

(a) School's present situation and the above project goals
We continue to put due emphasis on the development of various learning strategies for students.   Interactive learning is an important target in the School Development Plan of 2009-2012.

To match with the current education reform in the 21st century, our teachers always prepare themselves to develop new pedagogy for students to explore new ways of learning.   Teachers put top priority to train students' with various generic skills.

It is also more than common for our classrooms to integrate IT in the learning and teaching process with a view to enhancing learning outcome. Recently, we find that interactive whiteboard would be able to inspire varied and creative teaching materials.   Teachers can respond to a broad range of learning styles with the added visual, auditory and interactive elements in lessons.

(b) Readiness of our school for undertaking the project
Every classroom and special room of our school has already been installed with a projector and a desktop computer which are essential and necessary equipment for the setup of interactive whiteboard.   Teachers got a basic training to use interactive whiteboard from school-based workshops.   Over the last two years, our school has installed 3 sets of interactive whiteboards and a team of teachers is assigned to develop some teaching and learning packages that can be practised in classroom.   We found interactive whiteboard very useful for enhancing the learning motivation and outcome.   Thus, our school intends to have an extensive use of this kind of modern equipment in the coming years.

(c) Favourable factors for implementing the project
Our school teachers have the following experiences in successful implementation of QEF IT-related projects for enhancing learning and teaching.

Project No.1998/1351	Design & Development of Computer-assisted Learning of Mathematics Packages for S1 Students
Project No.2000/2060	A Whole School Approach to Training Thinking Skills
Project No.2003/0496	MOSTT Interactive Learning Platform for S1 Students
Project No.2005/0035	A Wireless Interactive Networking for School-based Enrichment Programmes
Project No.2007/0470	Development of F.1,2 Integrated Humanities Activities by Thinking Skills and Cooperative Learning

The project "A Whole School Approach to Training Thinking Skills (2000/2060)" was successfully completed and more than 10 sharing sessions in inter-school and inter-district levels were organised by EDB and District Teachers' Network (DTN56/2003).   Our school teachers also conducted five staff workshops for other schools in the development of thinking skills

The project "MOSTT Interactive Learning Platform for S1 Students (2003/0496)" has received favorable comments from various parties, inclusive of our stakeholders, other schools and the press.   The project also won a certificate of merit from the Education domain of HKICT Award.   We have conducted sharing sessions to disseminate our product to a number of schools and the public.   Recently, this project has received the QEF outstanding project awards in the QEF EXPO 2008.

We have a team of active, energetic and devoted teachers who would like to take up challenges to meet the new trend of education. Some representative teachers, who are also experienced in QEF projects, will be the members of this project while others are keen to implement the project activities in their teaching.

Last but not least, our students are well-behaved and interactive in learning (the recent QAI report commended this as well), especially when they are prompted with new challenges. They will be mostly benefited from this project.

(III) Targets and Expected Number of Beneficiaries

(a) Our school   : Direct - Form one to form three students (About 600 students)
                Indirect - All students would be benefited when they attend lessons in special rooms.
(b) Other schools : Our interactive teaching and learning materials will be uploaded to the web of Hong Kong Education City in order to share with all members of education sector.

(IV) Conceptual Framework

After ten years' development of IT in education based on the framework of the first and second strategic documents from Education Bureau, a significant progress was achieved in applying the available hardware and internet technology to support learning and teaching in schools. However, the final report (2007) on the second phase *Empowering Learning and Teaching with Information Technology* pointed out that it was vital for schools to *enrich digital resources for learning, improving IT infrastructure and pioneer pedagogy using IT.*

It is recommended that the digital resources should be able to match the curriculum of each KLA. At the same time, IT infrastructure should provide adequate support and convenience for the using of the resources. Strategies and planning are required for promoting digital resources to teachers in meaningful pedagogical contexts.

In 2008, Education Bureau announced that *Right Technology at the Right Time for the Right Task*, it is the human factor rather than the technical factor that is the essence for the successful integration of IT into learning and teaching. Our school shares the same vision as the Third strategy on IT in education. We are planning to introduce interactive whiteboard in every classroom of Junior forms in order to improve the IT infrastructure. Interactive whiteboard is not the most updated product, however, a lot of researches show that it enhances teaching and learning. Interactive whiteboard is more than a computer, a projector or a screen – its sum is greater than its parts.

Evidence has shown that teaching with interactive whiteboard can have positive effect on students' attainment (British Educational Communications and Technology Agency [Becta] 2002). In addition, many research studies such as Glover (2002) and Cuthell (2005) have noted that the use of whiteboards shifts instruction from presentation to interaction and students' focus away from teachers and onto content, making interactive whiteboard lessons more student centered than traditional ones. Current theories of learning such as Swan et al. (2007) emphasize the importance of actively engaging children in the learning process and a variety of digital technologies has been introduced in schools to support active engagement in learning.

After acquiring research evidence, a core group of passionate and experienced teachers has been formed. The core group is formed with panel chairs and experienced teachers from all core subjects in Junior forms which include Chinese, English, Mathematics, I.S. and I.H. Group members have already put theories into some practices. They are developing a new pedagogy that enriches lessons by infusing thinking skills and cooperative activities together with the use of interactive whiteboard. It enables seamless links to be made between the technology and the subject materials.

During the first half year of 2009-2010, each subject has produced two sets of learning packages (Refer to sample worksheets on P.6-9) which include a comprehensive lesson plan and student worksheets, together with all the required digital materials such as PowerPoint or web applications. It was found that a positive atmosphere for teachers' professional development has been cultivated and learning motivation for students has been greatly enhanced.

(V) Innovation

Interactive applications are in demand for educators who want to involve their students in learning with technology. The interactive whiteboard is a device that combines both the attributes of interactive learning and shared learning experiences in large or small groups. Dr. Mary Ann Bell (2002) conducted a survey among teachers who are whiteboard users to gather their opinions on the use of whiteboard. The survey results indicated a high degree of satisfaction from educational leaders ranging from early elementary to academic settings.

Our teachers started using interactive whiteboard two years ago. Based on their experiences, some practical benefits are concluded as follows.

- Interactive whiteboard is a colorful tool. Students respond to displays where color is employed, and marking can be customized both in pen and in the highlighter features to display a number of different colors. Width of lines can also be adjusted to add flexible marking choices.
- It can accommodate different learning styles. Tactile learners can benefit from touching and marking on the board, audio learners can have class discussion; visual learners can see what is taking place as it develops on the board.
- It is interactive. Users can contribute directly by using the computer or the board. The teacher at the front of the class and the whole class can be actively engaged in lesson.
- It is beneficial for participants to get printed copies of their contributions in lesson. At the end of a brainstorming activity, for example, copies of the resulting document can be printed and distributed, as well as saved for future use.
- It stimulates teachers to rethink their teaching pedagogy.

Interactive whiteboard presents both challenges and opportunities to teachers, particularly in terms of staff development and training. Research has shown that training and personal development involving coaching and mutually reflective activity is the greatest support to staff. Beauchamp (2004) also stated that whenever schools are going to invest in the use of interactive whiteboard in the classroom, they should also be aware that an investment will be needed in preparing teachers for the new role, both in terms of technical competence and classroom pedagogy.

In this project, there are two innovative points. Firstly, it infuses collaborative interactive learning style and thinking skills with interactive whiteboard. Wireless interactive whiteboards would also be used to facilitate the sharing and discussion among inter-groups or the whole class. Wireless interactive whiteboard is a small white square board (about 20cm × 20cm) connected to the main interactive whiteboard with Bluetooth. Students can write or draw on their own board and the contents will be displayed on the main board instantly.

Secondly, it focuses on staff training and supporting system rather than simply introducing the hardware to school. The core group is responsible for trial runs and developing teaching and learning packages. At the same time, the core group would provide training workshops and sharing sessions for other teachers. Teachers would develop both the technical skills to use interactive whiteboard and the ability to run interactive lesson through varied pedagogies with confidence.
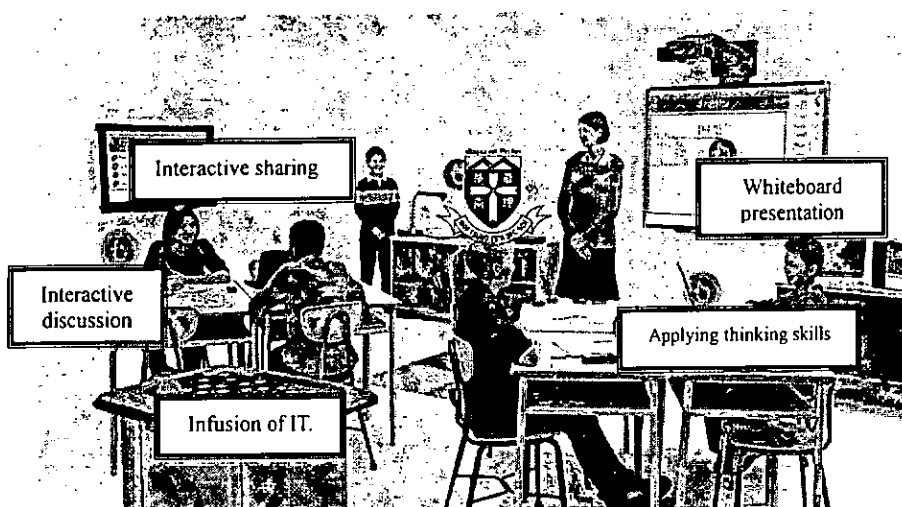
Enhancing collaborative learning and thinking skills with the use of interactive whiteboard

(a) Learning subjects:
   English, Chinese, Mathematics, Integrated Humanities, Integrated Science
(b) Whiteboard Tools:
   Whiteboards, Computer, Notebook computer, Wireless tablets

(VI) Extent of Teachers' and Principal's Involvement in the Project

About 12 key member teachers from 5 KLAs would take up the following tasks:

➤ Creation work for the project.
- Designing learning activities
  The key members would explore and design the most effective way of running learning activities with the aid of interactive whiteboard.
- Designing learning packages
  Based on the designed learning activities and packages including lesson plans, handouts, electronic teaching aids, required apparatus and equipment would be designed and prepared by the key members. These packages will facilitate teachers to implement different activities in a lesson.
- Designing a cross-subject interactive learning style
  Together with the change of teaching and learning pedagogy, our key members would design a cross-subject learning style. The innovative learning activities and the new technology would be infused in the curriculum.

➤ Training for teachers
  Training would be provided for all teachers in our school. They will learn to make use of interactive whiteboard to implement a lesson. At the same time, the key members would also conduct a series of sharing with other F.1 and 2 teachers who teach English, Mathematics, Chinese, Integrated Science and Integrated Humanities so that other teachers would learn to customize the teaching packages for the particular needs of their students. In addition, they would also be able to create their own lessons or convert paper-based material into digital content.

➤ Managing the data bank of the learning packages
  Throughout the year, relevant resources and packages would be collected in a central data bank. It would facilitate teachers with easy access to the resources through the school's server and school web page. Key members would coordinate the progress and communicate with the users of the platform.

➤ Evaluation of students' performance and progress
  In order to improve the quality of the packages, key members would exercise a close supervision over students' performance and progress. The key members may raise some new ideas or amendments based on the students' feedbacks.

Our vice-principal, being an experienced leader in Quality Education Fund and District Teacher Network projects, would be the advisor of this project to give valuable opinions and suggestions. He also assists in the promotion of all learning materials across subjects and ensures the products meet the needs of the school curriculum development.

(VII) Implementation Plan

(i) Time-line

Jul 2010	Aug 2010	Sep 2010	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Feb 2011	Mar 2011	Apr 2011	May 2011	Jun 2011	Jul 2011	Aug 2011
Tendering for Interactive Whiteboard			Installation of Interactive Whiteboard										
				Training workshop for development and collaboration of teachers									
				Development and design of learning packages									
								Classroom trial and implementation of learning packages					
									Fine tuning of learning packages and final evaluations				

(ii) <u>Proposed Worksheets for the Whole Packages</u>

(a) **English:**

F.1
- Countable and Uncountable nouns
- Prepositions of location
- Gerunds and to-infinitives

F.2
- Nouns without articles
- Fashion items
- Passive voice

F.3
- Reported Speech
- Conditional sentences
- Adjective patterns

(b) **Chinese:**

F.1
- 詩歌認識與創作
- 記錄的要素 (六何法)
- 人物描寫手法

F.2
- 借事抒情手法
- 借景抒情手法
- 詞曲認識與創作

F.3
- 場面描寫、細節描寫手法
- 借事說理手法
- 劇本創作

(c) **Mathematics:**

F.1
- Symmetry and Transformation
- Congruence and Similarity
- Introduction to Coordinates

F.2
- Angles in Triangles and Polygons
- Pythagoras' Theorem
- Rate and Ratio

F.3
- Quadrilaterals
- More about 3-D Figures
- Coordinate Geometry of Straight Lines

(d) **Integrated Humanities:**

F.1
- 每當變幻時(天氣)
- 人類的起源
- 資料分析

F.2
- 全球化初探
- 經濟與環保
- 中國氣候天災

(e) **Integrated Science:**

F.1
- Introducing Science
- Cells and Human Reproduction
- Energy

F.2
- Making Use of Electricity
- Space Travel
- Sensing the Environment

中一級綜合人文科教案
題目：每當變幻時(天氣)
班級：中一級
時間：80 mins

教學目標：
1. 認識香港天氣和氣候的變化；
2. 從日常生活中體驗天氣和氣候變化對人的影響；
3. 因應需要設計一件具多功能用途之物品供日常使用。

時間	教學目的	教學內容	教材/內容	形式
5 mins	弓I起動機	透過剪報帶出氣候變化對人類活動的影響。	剪報	
10 mins	認識天氣和氣候的分別和瞭解香港的氣候變化	介紹香港四季的天氣變化。	ppt---天氣	
10 mins	從日常生活的體驗中判斷不同季節和氣候之變化對人類生活的影響	每組獲分發一份閱讀資料，利用該資料內容推理出是描述那一季節，同學須合作填寫一份簡單推理報告。	四季推理 (電子白板)	分組利用點指兵兵 (Number head Together)方法判斷推理答案。
30 mins	以腦震盪及腦圖因應需要設計一件具多功能用途之物品供四季使用－創造力	每組須設計一件具多功能用途的物品供不同天氣使用。 (1) 用圍圈說先思考四季的不同天氣狀況 (2) 先以腦震盪繪畫腦圖，並分組繪畫在電子白板上 (3) 利用(Three-minutes-review)檢討腦圖，並着同學寫其他組別的腦圖提出更好的建議或修改，直接改於電子白板上 (4) 設計將設計繪於電子白板上	-多功能物品設計 (電子白板)	分組利用圍圈寫 (Roundtable)及/或圍圈說 (Roundrobin)的方式：著學生進行腦震盪，並在組中集思廣益，以完成設計任務。 利用(Three-minutes-review)作中段檢討。
20 mins	分組匯報	(1) 分組匯報 (2) 投票選出最佳作品。(不可投自己的一組)		
5 mins	總結	(1) 透過天文台網站等公共資料協助同學瞭解氣候對日常生活的影響，並介紹當中有用的資訊如七日天氣預報等。		

(iii) Sample Worksheet
(a) F.1 I.H. lesson plan

Schedule I P.11

(b) F.2 I.H. lesson plan

中二級綜合人文科教案

題目：全球化初探 I

班級：中二級

時間：80 mins

教學目標：

1) 認識何謂全球化
2) 探討全球化帶來的影響（特別是香港）

時間	教學目的	教學內容	教材/內容	形式
15mins	透過配對及老師講授，認識何謂全球化	- 著學生在白板上寫出他們認為與全球化有關的物品，以至他們對全球化現象的理解。(在完成圖咭活動後，透過互動電子白板的功能，對比在活動前後，學生對全球化的理解有何不同。) - 完成分組活動後，著學生在互動電子白板上配對有關跨國企業及其描述的圖卡。 - 文章探究：派發有關全球化文章予學生，再著學生反思問文章，提出相關問題。最後要求學生在電子白板上互相分享。	圖卡¹(電子白板) PPT 文章探究：<什麼是全球化?> (電子白板)	分組完成配對
20mins		- 再次提問學生「什麼是全球化?」，要求學生在白板上寫出其看法。 - 運用互動電子白板的功能，讓學生重看較早前寫上的看法，以作對比。而且提問學生寫何在看法上的轉變，以作反思。 - 最後，老師以簡報展示閱讀文章趙永佳<什麼是全球化?>的重點，從而加深學生對全球化之認識。	提問	Three minutes review
20mins	探討不同文化視域下的全球化角度	**閱讀地圖並完成「看地圖 看世界」工作紙** - 著學生利用電子白板，拼出世界地圖的「五大洲」，以重溫學生的基本地圖知識。 - 學生根據地圖上的描述，找出地圖所述的國家，並著學生在白板上即時寫上國家名，以訓練地圖閱讀技巧。	地圖 看地圖 看世界(電子白板)	運用 RoundRobin Brainstorming 分組完成
15mins	以「迪士尼」為例，透過小組討論探討全球化帶來的正負面的影響	- 透過香港迪士尼開幕的情況，了解跨國公司對香港的正面影響 - 透過「血汗工場」的影片，認識跨國公司的負面影響 - 指出馬時亨對「注資迪士尼」的看法，帶出迪士尼對香港的影響是福?是禍?	PPT 影片： (1)迪士尼開幕的盛典 (1 mins 23 secs) (2)「血汗工場」	着同學分組反思迪士尼對香港是福是禍 (Think-Pair-Share) 如時間許可，抽問部份同學意見(Number head Together)
10mins	總結	向學生總結全球化帶來的影響，並着學生思考全球化對我們是福是禍?		Three minutes review

(c) F.2 Maths Lesson Plan

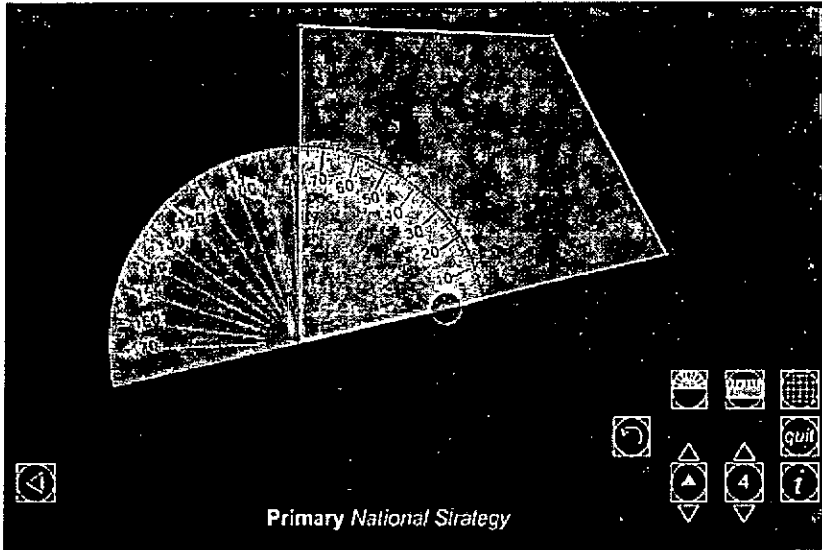Topic: Angle sum of polygon (Interior angles and Exterior angles)
Level: Form 2

	Content	Remark	Time
Introduction	Teacher introduces the main concepts of various terms about polygon, such as edges, vertices, equilateral, equiangular, regular, convex and concave, by using a PowerPoint on interactive whiteboard.	Thinking Skills (Part and Whole)	10 min
Development 1	Teacher briefs the objectives and procedures of *Task I* and *Task II* to students.		5 min
	Task I: Teacher demonstrates how to measure the interior angles of polygons with protractor by using "polygon.exe" on interactive whiteboard. Each group is asked to measure the interior angles of different polygons and key in the interior angles into the Excel file "Angle Sum of Polygon". Students are asked to explore the formula for the sum of the interior angles of polygons. Some groups may share their results with the whole class with the wireless tablet. Teacher would act as a facilitator to guide students to get the generalization.	Thinking Skills (Cause and Effect) + Cooperative Learning (Group Investigation)	15 min
	Task II : Teacher introduces another method to investigate the formula for the angle sum of the interior angles of polygons. Teacher demonstrates how to use the java applets in the web page of Exploring Angle Sum Using Half Turn on interactive whiteboard. (http://connectedmath.msu.edu/CD/Grade6/AngleSum/) Students are asked to find out the sum of interior angles of polygon and complete the table. Each group may be asked to share how to find out the sum of interior angles of polygons and their investigation of the change of the sum of interior angles of a polygon as the number of sides is increased on interactive whiteboard.	Thinking Skills (Identifying Assumption) + Cooperative Learning (Group Investigation)	15 min
Development II	Teacher asks students to investigate the property about the sum of exterior angles of polygon. **Task III:** The web site of Exterior Angles of Polygons (http://www.worsleyschool.net/science/files/polygon/exterior2.html) is introduced on Interactive Whiteboard. Students are asked to investigate the sum of exterior angles of polygons and share their investigation with the whole class.	Cooperative Learning (Say and Switch)	10 min
Conclusion	Students are asked to state the formulae for the angle sum of the interior angles of polygons and the sum of exterior angles of polygons.		5 min
Consolidation	Students are asked to apply the formulae to solve the questions. Some groups are asked to show their solutions with their wireless tablets.		10 min

(d) Mathematics Sample Worksheet

You may explore the formula by finding the sum of interior angles of polygons

with the following software.

1. Open the file "Polygon". You may find the software on the desktop of your

    PC or through network   demo2\Maths\Beams\Angle Sum of Polygon.

2. Choose the number of side of the polygon and measure all interior angles

    of the polygon with protractor.

Primary National Strategy

3. Open the excel file "Angle Sum of Polygon" on the desktop of your PC or

    through network demo2\Maths\Beams\Angle Sum of Polygon.

6. Similarly, you would be able to find out the sum of interior angles of other

    polygons. Complete the following table.

Polygon	Shape	Number of sides	Sum of interior angles of polygon
Triangle			
Quadrilateral			
Pentagon			
Hexagon			
Heptagon			
Octagon			
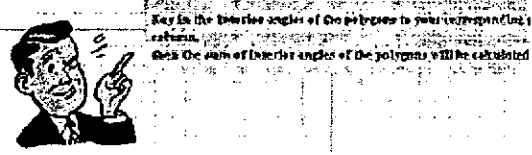
(iv) (a) <u>Pre-lesson work</u>

Collaborative lesson preparation is a common practice in our school. After the draft version of each learning package is produced, a group of respective teachers will explore the concepts again, fine-tune various contents and design the actual lesson plan.

(b) <u>Post-lesson review</u>

Based on our experience with the cooperation with CUHK (PILT), every designed lesson would undergo several trials. Post lesson review such as sharing and discussion session will be arranged once every 2 weeks in order to collect feedback from colleagues and explore means of adjustment to the course materials.

(v) <u>Plan for Continuous Development</u>

This project aims at both improving IT infrastructure and providing ample digital resources for teachers. After completion, the whole set of learning packages would be uploaded to the web of Hong Kong Education City so that teachers of other schools can easily access to the resources. The core group would also provide staff training to all teachers outside the group. Meanwhile, teachers from the core group will be the mentors for other teachers. With all the above arrangements, teachers are able and willing to make good use of interactive whiteboard.

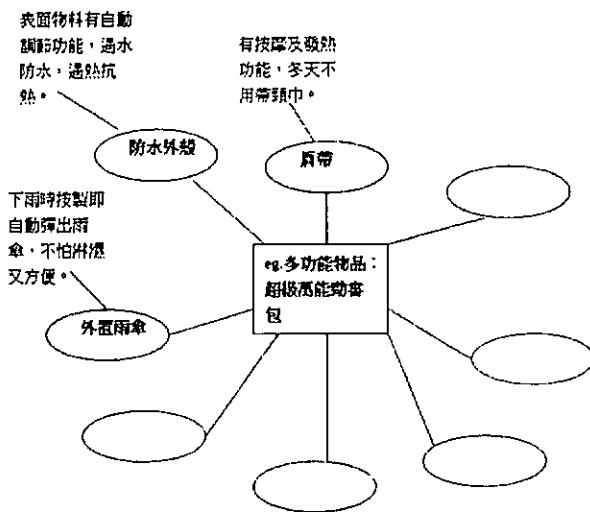(vi) <u>Effects of Interactive Whiteboard</u>

(a) IES

Students can be more motivated and responsible learners by using interactive whiteboard. During lessons, students are given their own wireless tablets, therefore they can raise their questions instantly. In the Template of F.2 IH, students are told to read those passages about globalization independently (refer to P.7). Teachers just act as facilitators in the task as students have to construct knowledge by themselves. They can underline or jot notes as they are reading. Moreover, they can exchange ideas with other groups. Students are "independent" and "self-directed" learners in IES.(Liberal Studies Curriculum and Assessment Guide) The key objective of education-"Learning to Learn" can be promoted.(Life-wide Learning, Basic Education Curriculum Guide)

Students can have more interactive presentation by using interactive whiteboard, as students and teachers can comment and review the works and projects of other groups directly. As shown in F.2 IH Template, Activity 1 requires students to match "Cards of Companies or Organizations" with those "Descriptions and Details" (refer to P.7 F2 IH Template p.1). Students have to search relevant information first and then organize and classify their findings. By using wireless tablets and interactive whiteboard, they can present their findings and arguments to other groups instantly while others have chances to determine the strength of the arguments and make reasonable judgments. Useful suggestions and feedbacks from other groups can be shown on interactive whiteboard correspondingly.

According to the Guide (Liberal Studies Curriculum and Assessment Guide), interactive whiteboard can be used to help students to "set goals, plan, implement the plans and reflect on and solve problems." The Guide also stated that interactive whiteboard can help students to "reflect on and evaluate their learning progress" as well as "communicate, articulate and present their thoughts and ideas effectively through appropriate means and media." As shown in the F.1 IH Template, Activity 1, students are divided into groups and given a task to design a multi-functional outdoor tool which can cope with different weathers. Tablets will be used to draw mind maps and prototype. Afterwards, students can present their works on interactive whiteboard. Feedback will be given by other groups and improvements can be made instantly. They can also use Adobe Illustrator to draw pictures and make amendments. Presentations can be saved and shared between groups and even classes. Thus, learning progress of the IES can be recorded systematically. Students can have critical reviews or reflections on different stages of their learning. Moreover, teachers can review and give feedback easily and immediately through interactive whiteboard system. It is indicated that one of the most effective ways to enhance learning effectiveness is to provide students with meaningful and constructive verbal or written feedback so that both teachers and students may have a better understanding of the learning process and how they can work together to improve learning.

(b) Thinking skills

Students can develop critical thinking skills through investigative exploration of issues because interactive whiteboard can show multi-pages simultaneously that help students to compare their coursework effectively. The Template of F.1 IH which asks students to identify the corresponding seasons is an example (refer to P.6). It is shown that students can benefit from each other's insights, experiences, achievements, and mistakes through interactive whiteboard. The method "Number Head Together" is used with the help of interactive whiteboard in the activity. Students are divided into four groups. Each group has to decide which season is described in the task. Groups should work together to answer the question. Moreover, each member is given numbers of 1, 2, 3, 4 to take different roles in completing the task. For example, students with the number "1" are the recorders to write down the answer on the wireless tablets. Answers from different groups therefore can be shown on interactive whiteboard directly by using the "Multi-pages function" of interactive whiteboard.

表面物料有自動
調節功能，過水
防水，過熱抗
熱。

有按摩及吸熱
功能，夏天不
用帶頭巾。

防水外殼

頭帶

下雨時按製即
自動彈出雨
傘，不怕淋濕
又方便。

外置雨傘

•多功能物品：
超級萬能救濟
包

With the use of maps and graphic organizers of interactive whiteboard, students can analyze information cooperatively. The Template of F.2 IH (see attached) shows that students have to find out the names of the countries by analyzing the information provided on the maps. Using the method "RoundRobin Brainstorming" to discuss the answers, one of the students from a group is appointed as "recorder". Students have to fill in the countries' names in the "think time". Students take turns to give supporting evidence of their answers until the "think time" is called. Therefore, generic skills such as analyzing skills, collaboration skills and communication skills can be developed.

Interactive whiteboard can help students develop their creativity. Using interactive whiteboard, students can show their ideas either by words or graphics during presentation. For example, the Template of F.1 IH (see attached) shows that students are encouraged to draw their mind maps by words or drawings. After drawing their drafts, students have a "Three-minutes-review" to evaluate and edit others' mind maps. Consequently, interactive whiteboard will not limit students' idea, but will enhance their creativity.

Mathematics always involves abstract concepts or special questions. As in our examplar of Mathematics(refer to P.9), students have to study some properties of polygons. With interactive whiteboard, it promotes real whole-class discussion and encourages students to make conjectures. Many web resources or softwares provide various tools facilitating teachers and students to explore their ideas. For example, students would use software to produce their own polygon and measure all the interior angles. After they have a draft assumption, the software let them change the shape of the polygon with a simple drag and drop motion on the interactive whiteboard. Interactive whiteboard is a great help for identifying assumption.

(c) Collaborative skills

Interactive whiteboard provides interactive ground for students to exchange their ideas during lessons (See both F1-2 IH Templates, activities planning). Since students can exchange their ideas with other groups, with the wireless tablet and electronic whiteboard, the electronic whiteboard system is an appropriate platform to communicate, articulate, and present thoughts and ideas effectively.

By sharing different views in discussions on interactive whiteboard, students learn to give balanced considerations to the issues discussed, and to make reasonable judgments. They can comment on the views of other groups on interactive whiteboard immediately. By adjusting their ideas, students can learn how to compromise with their group mates. Communication skills can be greatly developed.

Interactive whiteboard is an effective tool to encourage students with lower learning abilities to participate in classroom activities, as students can present their ideas in easier ways such as making mind maps (e.g. the template of F.1 IH about the 'Design of a Multi- functional Outdoor Tool').

Interactive whiteboard is able to facilitate if ideas sharing especially when it is used together with wireless tablet. As indicated in the Mathematics' examplar, all students are divided into different groups to examine the properties of polygon. Students can save all their rough works on their own PC. And, the rough works of every group can subsequently be displayed on the interactive whiteboard for whole class discussion. Students can even make some comments on the work of other groups.

(d) IT skills

Students can learn and apply their IT skills in learning Humanities subjects. Students can integrate IT into learning and teaching across the curriculum, and present their own ideas by interactive whiteboard system. As shown in F.1 and F.2 Templates, IT is heavily employed as a learning tool.

Students can deploy resources strategically through interactive whiteboard. During lessons, students can search for data and information by the wireless tablets instantly, so their ability of searching information can be improved and developed. They thus become on self–learning students.

Interactive whiteboard is excellent for teaching Geometric topics of Mathematics. Students are motivated by the clear examples produced by the geometric software. Students soon become competent to select and drag the lines and shapes. Interactive whiteboard has enabled students to experience a wider range of examples and visual explanations of shape and space concepts.

Deliverables:

- A series of learning packages for the following five key learning areas:

English	F.1-3	9 sets
Chinese	F.1-3	9 sets
Mathematics	F.1-3	9 sets
Integrated Science	F.1/2	6 sets
Integrated Humanities.	F.1/2	6 sets

Total = 39 sets of lesson plans, worksheets, activity outline and electronic materials

- A data bank of teaching packages on web page.

Outcomes:
- Students' learning diversities can be catered for
- Students' potential can be stretched
- Students' generic skills can be enhanced
- Teachers can acquire more IT and curriculum development skills in teaching
- Teachers can have more opportunities to have collaborative lesson preparation
- Teachers can refresh current pedagogy
- Both students and teachers can master more modern IT skills in learning and teaching

(IX) <u>Budget</u>

Staff Cost	Supply Teacher (1 GM teacher for 12 months including 5% MPF)	$22 985p.m. × 12 + $1000 × 12
	Sub-total	$287,820
Equipment	Interactive Whiteboard ($12,000@) (15 pieces including installation fee)	$180,000× 50% subsidy by school = 90,000
	Software for producing digital teaching and learning materials	$4,000
	Sub-total	$94,000
Services	Staff Workshop Sub-total	$5,000
General Expenses	Reference Materials, etc.	$4,000
	Printing cost : teaching materials, etc.	$1,500
	Miscellaneous items	$1,580
	Sub-total	$7,080
	Total	$393,900

Duty of Supply Teacher : i.   To substitute two to three lessons per cycle for the core members (total ≈ 12 teachers) so as to provide space for them to plan, implement and evaluate the whole QEF project.

ii.   To assist the implementation of QEF project.

Asset Usage Plan

Category	Item / Description	No. of Units	Total Cost	Proposed Plan for Deployment
Computer hardware	Interactive Whiteboard	15	$180,000	For use by school
Computer software	Software for producing digital teaching and learning materials	Some	$4,000	For use by school

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 1/7/2010 - 31/12/2010	31/1/2011	Interim Financial Report 1/7/2010 - 31/12/2010	31/1/2011
Progress Report 1/1/2011 - 30/6/2011	31/7/2011	Interim Financial Report 1/1/2011 - 30/6/2011	31/7/2011
Final Report 1/7/2010 - 31/8/2011	30/11/2011	Final Financial Report 1/7/2010 - 31/8/2011	30/11/2011

(X) Evaluation Parameters and Method

The evaluation methodology consists of three components : Baseline, Benchmarks and Performance Indicators.

Baseline data	Benchmarks	Performance Indicators
Teachers present pedagogy	Teaching methods should cope with the challenges and demand of the education reform.	More student-centred learning activities should be developed.
Students present learning style	The learning motivation and interest should be enhanced.	Over 90% of students will be engaged in the process of interactive learning. More students will explore further topics.
Students with previous knowledge in the five KLA	The performance of students in their studies should be enhanced.	The average examination results of F.1-F.3 students will be improved as compared with those of previous years.
Students with existing IT skills	The interest and ability of students to apply IT in their future studies should be raised.	All students should be able to master electronic interactive whiteboard.

All objectives of the project will be evaluated. The output/outcome measurements are as follows :

Items	Evaluation Methods	Time	
		Pre-project	Post-project
IES skills	Questionnaires to students Observations by teachers Analysis of project exercises and quizzes	N.A.	6/2011
Thinking skills	Questionnaires to students Observations by teachers Lesson observations by senior teachers and the Principal	10/2010	6/2011
Collaborative interactive learning skills	Questionnaires to students Observations by teachers Lesson observations by senior teachers and the Principal	10/2010	6/2011
IT skills in learning	Questionnaires to students Comparison of pre and post project results of computer examinations for students.	9/2010	7/2011
Use of electronic interactive white board	Questionnaires to students Observations by teachers	12/2010	6/2011

(XI) Sustainability of the Outcomes of the Project

The project is designed for F.1 to F.3 students.   All the interactive learning packages can be re-used in the future. They will be kept updated when the project is being implemented. The school will also be responsible for the maintenance of the materials.

(XII) Dissemination / Promotion

The whole product would be up-loaded to the web of Hong Kong Education City for public sharing.   As in previous projects, our school will organize sharing sessions and workshops with other schools. We will also keep joining the sharing sessions organized by the QEF secretariat, EDB and some other schools.

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