II Project Information

Project Title (in English)	Project Title (in Chinese)
Math Portal	數學入門

A. Project Summary

The Education Bureau states in the Common Descriptors of Associate Degree (AD) and Higher Diploma (HD) Programmes (http://www.ipass.gov.hk/eng/reg_sd.aspx) that one of the learning outcomes of AD/HD programmes is to equip students with "*A solid foundation of generic skills, including languages, IT, interpersonal communication,* ***quantitative and analytical skills****, and* ***the ability to learn how to learn****"*. However, as the study of mathematics and statistics is not compulsory in the curriculum of senior secondary education, freshmen of sub-degree programmes usually have diverse mathematical backgrounds. Educators in community colleges in Hong Kong face significant challenges in helping students, particularly those with a lower level of numeracy, to enhance their quantitative and analytical skills and to be numerically literate. Finding resources to explore multiple ways to assist students in strengthening their numeracy has thus become one of the major tasks of our College to improve the quality of the graduates of AD/HD programmes.

The proposed project is aimed at providing additional support for students, particularly those with a lower level of numeracy, to learn the compulsory mathematics and/or statistics subjects, and to enhance students' learning effectiveness by improving their mathematical ability, analytical skills and numerical sense. The funding of this project will be used in three main areas: (1) Math Learning Center; (2) Remedial courses for students with a lower level of numeracy; (3) Self-directed Learning Software.

(1) Math Learning Center

A Math Learning Center will be set up to provide students with an additional channel to seek help for mathematics-related problems which they encounter during their studies. The Center will provide a relaxed, friendly and supportive atmosphere for students to learn mathematics. By working with other students and experienced staff, students will have a better understanding of the concepts covered in their mathematics and/or statistics classes.

(2) Remedial Courses

Students with a lower level of numeracy or limited mathematical backgrounds are required to attend the remedial courses which will review the fundamental but essential mathematical concepts that have been covered in the secondary school curriculum. The remedial courses equip students with a better foundation in mathematics. Upon the completion of the remedial courses, students will be able to cope with their learning of stage-1 mathematics and/or statistics subjects.

(3) Self-directed Learning Software

The self-directed learning software is a platform for students to review the key mathematical and statistical concepts, as well as to evaluate their own ability. The software will be accessible at the computers located at the Math Learning Center. The three major functions of the software are:

(a) Learning Materials

Basic knowledge in statistics and mathematics will be grouped into different categories and presented in an interactive and animated approach. Simple and local real-life examples will also be used for illustration. Diagnostic exercises can be found at the end of each section. When attempting the exercises, students may refer to the learning materials, and hints will be given whenever appropriate.

(b) Quizzes

Computer-based quizzes will be designed for students to evaluate their own ability. Based on the scores of the completed quizzes, students will be provided with appropriate recommendations for further enhancement of their mathematical ability.

(c) Supplementary Information

In this section, students will be able to explore some supplementary materials, such as a glossary of statistics terms, the history of mathematics etc.

B. Project Objectives

Educators of sub-degree programmes face a major challenge in helping students with a lower level of numeracy to enhance their numerical ability and hence to cope with the quantitative and analytical skills required for completing the sub-degree programmes. The overall purpose of the proposed project is to provide students with additional support in learning mathematics and statistics as well as to improve their numerate literacy and, ultimately, to enhance their learning effectiveness and to improve the quality of graduates, in terms of quantitative and analytical skills. Specifically, the project intends to:

- equip students with better foundations in mathematics and statistics;
- enhance students' learning effectiveness by improving their mathematical ability, analytical skills and numerical sense;
- offer additional learning resources to help students learn mathematics and statistics;
- facilitate and encourage independent self-directed learning; and
- provide a platform for students to evaluate their own numerical ability and seek advice for further enhancement.

C. Outcomes and Deliverables of Project

I. Project Outcomes

(1) Math Learning Center

The services provided by the Math Learning Center will be free and on a walk-in basis. The Center will open during term time from 14:00 to18:30. The center at the West Kowloon campus will open on Mondays, Wednesdays and Fridays, whereas the center at the Hung Hom Bay campus will open on Tuesdays and Thursdays. The assistance that students may obtain from the Math Learning Center is as follows:

- assistance in doing tutorial exercises;
- counselling on mathematics learning;
- individual and small group learning support sessions;
- use of computer software and other technology to assist and improve learning in mathematics;
- advice on the appropriate learning materials and software.

Target beneficiaries:

Students who need to take any one of the following compulsory mathematics / statistics subjects (i.e. around 3,300 students):

- Quantitative Methods for Business
- Elementary Statistics
- Mathematics
- Introduction to Calculus and Linear Algebra
- Business Statistics

Expected outcomes:

Under the operation of the Math Learning Center, students will be able to seek additional support promptly and straightforwardly, whenever they encounter difficulties in learning the compulsory mathematics / statistics subjects of their sub-degree studies.

(2) Remedial Courses

An entry test on numerate literacy will be administered to all stage-1 students before the commencement of the first semester of their sub-degree studies. The test is divided into three main sections, namely, Elementary Algebra, Pre-Calculus, and Basic Statistics. Each covers some key concepts of mathematics and/or statistics that are fundamental but essential for future studies and/or career development.

The following remedial courses, corresponding to the different areas covered in the entry test, will be offered. Students are required / encouraged to join the remedial courses which are suitable for them, with reference to their scores in different sections of the entry test.

- Remedial Course on Elementary Algebra (12 hours)
- Remedial Course on Pre-Calculus (12 hours)
- Remedial Course on Basic Statistics (12 hours)

Upon the completion of the remedial courses, students are required to sit for a progress test.

Target beneficiaries:

Students who fail in the entry test on numerate literacy. It is estimated that one-third of the first year students (i.e. around 1,200 students) will attend one or more of the above remedial courses.

Expected outcomes:

Upon the completion of the courses, students will be able to

- strengthen the foundation concepts in mathematics and statistics;
- enhance the quantitative and analytical skills required for success in sub-degree studies;
- gain confidence in tackling numerical problems.

(3) Self-directed Learning Software

During the opening hours of the Math Learning Center, students may log on to the computers located at the center to use the self-directed learning software. Students may review the learning materials, work out the self-practice exercises, or attempt the quizzes. Upon the completion of the quizzes, recommendations for further enhancement will be given.

Target beneficiaries:

Students who are eager to strengthen their mathematical ability through a flexible and independent learning mode.

Expected outcomes:

Through the use of the self-directed learning software, students can enhance their mathematical ability and learn how to learn independently.

II. Deliverables

- Remedial Course on Elementary Algebra (12 hours), Remedial Course on Pre-Calculus (12 hours) and Remedial Course on Basic Statistics (12 hours)
- Entry test on numerate literacy
- Progress test
- Teaching and learning materials developed for the remedial courses, including notes, worksheets, exercises, etc.
- Self-directed learning software. Upon the completion of the project, the software will be installed in the computers at HKCC computing laboratories for students' access.
- Statistical analysis on students' performances on different areas of mathematics before and after taking the remedial courses.

D. Implementation Details

The implementation of this project is divided into two stages from September 2010 to August 2012.

Stage I: Project Preparation

(1) Self-directed Learning Software (construction / update / maintenance)

To ensure the quality and cost-effectiveness of the self-directed learning software, we propose to hire a software development company to design, construct and maintain the software.

(2) Recruitment of a Part-time Project Assistant

A part-time project assistant will be employed to handle administration duties.

Duties:

- Provide administration support in the implementation of the project;
- Liaise with the project owner and other team members concerning the implementation of the project.

(3) Recruitment of Teaching Staff for the Remedial Courses

Part-time teaching staff will be employed to conduct the remedial courses.

Duties:

- Develop teaching and learning materials for the remedial courses, including notes, exercises, worksheets, etc;
- Develop test banks for the entry test and progress test;
- Conduct the remedial courses;
- Mark students' assessments and provide feedback on their progress;

- Review the materials;
- Assist the project owner in the project review.

Stage II: Project Implementation

Timeline	Math Learning Center	Remedial Courses	Self-directed Software
Sep 2010	Project Preparation – recruit a part-time project assistant		
Sep 2010–Oct 2010	· Operation of the Math Learning Center (Semester 1)	· Recruit teaching staff for developing test banks for the entry test and progress test	· Search for a suitable software development company
Nov 2010–Dec 2010	· Operation of the Math Learning Center (Semester 1)	· Prepare test banks for the entry test and progress test	· Prepare the content materials for the software
Jan 2011–Feb 2011	· Review of operation	· Prepare test banks for the entry test and progress test	· Prepare the content materials for the software
Feb 2011	· Interim Project Review - review the implementation of the project (critical review of the operations of the projects, tasks completed, problems encountered, actions to be taken for improvement, etc.)		
Mar 2011–Apr 2011	· Operation of the Math Learning Center (Semester 2)	· Recruit teaching staff for developing teaching and learning materials for the remedial courses · Prepare the learning and teaching materials for the remedial courses	· Construction of the software
May 2011–June 2011	· Operation of the Math Learning Center (Semester 2)	· Prepare the learning and teaching materials for the remedial courses	· Construction of the software
July 2011–Aug 2011	· Review of operation	· Administer the entry test to 1st year sub-degree students · Recruit teaching staff for conducting the remedial courses	· Test run of the software
Aug 2011	Interim Project Review - review the implementation of the project (critical review of the operations of the projects, tasks completed, problems encountered, actions to be taken for improvement, etc.)		

Sep 2011–Oct 2011	· Operation of the Math Learning Center (Semester 1)	· Implementation of the remedial courses	· Launch the software (Test version)
Nov 2011–Dec 2011	· Operation of the Math Learning Center (Semester 1)	· Implementation of the remedial courses	· Collect users' feedback on the software
Jan 2012–Feb 2012	· Review of operation	· Administer the progress test to students taking the remedial courses	· Update and maintenance of the software
Feb 2012	· Interim Project Review - review the implementation of the project (critical review of the operations of the projects, tasks completed, problems encountered, actions to be taken for improvement, etc.)		
Mar 2012–Apr 2012	· Operation of the Math Learning Center (Semester 2)	· Statistical analysis on students' performance before and after taking the remedial courses	· Launch the software
May 2012–June 2012	· Operation of the Math Learning Center (Semester 2)	· Review and update the test banks	· Collect users' feedback on the software
July 2012–Aug 2012	· Review of operation	· Review and update the materials for the remedial courses	· Update and maintenance of the software
Aug 2012	Final Project Review - review the implementation of the project		

E. Implementation Schedule *(Please extend this table if necessary.)*

Estimated start date of project: September 2010

Action *(please indicate key milestones)*	**Timeframe**	**Cashflow Requirement**
· Recruit a part-time project assistant · Implementation of the Math Learning Center · Review the operation of the Math Learning Center · Recruit teaching staff for developing test banks for the entry test and progress test · Prepare test banks for the entry test and progress test · Identify the specifications of the self-directed learning software · Develop materials for the self-directed learning software	Sep 2010 to Feb 2011	$241,113

· Implementation of the Math Learning Center · Review the operation of the Math Learning Center · Recruit teaching staff for developing teaching and learning materials for the remedial courses · Develop teaching and learning materials for the remedial courses · Administer the entry test to all 1st year sub-degree students · Recruit teaching staff for conducting the remedial courses · Perform a test run of the self-directed learning software	Mar 2011 to Aug 2011	$168,887
· Implementation of the Math Learning Center · Review the operation of the Math Learning Center · Implementation of the remedial courses · Administer the progress test to all students taking the remedial courses · Launching, updating and maintaining the self-directed learning software (test version)	Sep 2011 to Feb 2012	$914,800
· Implementation of the Math Learning Center · Review the operation of the Math Learning Center · Statistical analysis on students' performances on different areas of mathematics before and after taking the remedial courses · Review and update test banks for the entry test and progress test · Review and update the materials for the remedial courses · Collect and review users' feedback on the self-directed learning software · Launching, updating and maintaining the self-directed learning software · Auditing of Project Account	Mar 2012 to Aug 2012	$98,200

Estimated completion date of project: August 2012

F. Project Budget

Projected Expenditure *(Please provide detailed breakdown under each item)*	**Amount in HK$**					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
a. Manpower · Part-time Project Assistant	$7000x12+ MPF = $88,200	$7000x12+ MPF = $88,200				$1,222,425

· Teaching Staff for remedial courses and consultation		$500x12 hours x 43 classes x 3 courses + MPF = $812,700				
· Analysing of data and writing of report		$500 x 84 hours + MPF = $44,100				
· Development of teaching materials	84 hours for 3 courses + MPF = $90,000					
· Development of test banks	$500 x 63 hours x 3 areas + MPF = $99,225					
b. Equipment / Facilities						$50,000
· Computers and software	$50,000					
c. Services						$80,000
· Construction, update and maintenance of software	$40,000	$40,000				
d. General Expenses						$65,575
· Books and references	$3,000	$3,000				
· Cost of administration of entry test and progress test	$30,000					
· Cost of organising remedial courses		$10,000				
· Photocopying	$5,000	$5,000				
· Miscellaneous	$4,575	$5,000				
e. Others						$5,000
· Auditor’s fee		$5,000				
Total Expenditure :	**$410,000**	**$1,013,000**				**$1,423,000**

Projected Income	Amount in HK$					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
a. (e.g. fees received)						
b.						
c.						
Total Income :						

Sources of Funding

a. Amount of grant sought under this application: $1,423,000

b. Other sources of funding *(this may include donations, contributions from the applicant/its parent organization, etc. Please give the name(s) of the sponsor(s), the amount of funding, and indicate whether the funding has been secured.)*:

(i) _____

(ii) _____

(iii) _____

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G. Monitoring and Self-evaluation Mechanism

The project outcomes will be assessed with reference to the following Quality Assurance mechanism of our College:

- Student feedback questionnaire (Quantitative and qualitative feedback on the effectiveness of the remedial courses)
- Post-teaching report on the remedial courses (Qualitative feedback from the subject lecturers)
- Statistical analysis on students' performances in the entry test and progress test

In addition, an interim project review will be conducted in February 2011, August 2011 and February 2012; and a final review in August 2012. Progress reports will be prepared in February 2011, August 2011 and February 2012 respectively; and a final report on the project evaluating the implementation of the project will be compiled after the completion of the Project in August 2012.

H. Management Support and Key Personnel Involved

Administrative arrangements (Key personnel involved: Programme Directors)

- Reallocate the resources of the College to facilitate the availability of time, space (e.g. venue for the Math Learning Center) and resources (e.g. manpower and facilities) for developing and implementing the programme.
- Provide ongoing support to maintain sufficient collaboration of efforts among the staff members concerned, e.g. provide the statistics / information required for the project review, offer administrative support for the implementation of the project, etc.

I. Special Justifications if the Grant Sought Exceeds $2 million

N/A