Part C   Project Details

1. Background

Hong Kong has launched three IT in Education Strategies, beginning with the first strategy, *Information Technology for Learning in a New Era: Five-year Strategy,* in November 1998. The second strategy, *Empowering Learning and Teaching with Information Technology,* was launched in 2004 and completed in 2007. The third strategy, *Right Technology at the Right Time for the Right Task,* is currently in the middle of its implementation. Each strategy represents significant investments in terms of financial and human resources investment, at government, school and teacher levels, and is justified by the expectation that appropriate integration of ICT into the school curriculum to support learning and teaching is necessary to prepare our younger generation with the skills and attitudes for life in the 21st century. However, how do we know whether our strategies and their implementation are in the right direction? Are the impacts of our strategic implementation on teachers' practices and students' learning outcomes comparable to those achieved in other countries? These are important questions that can only be addressed through rigorous research, and in particular, rigorous international comparative studies of ICT in education. This is a proposal for Hong Kong to participate in the International Computer and Information Literacy Study (ICILS) conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA).

The need to have high quality research data to inform policy and practice is recognized by policy makers in many countries and, in response to this need, the IEA has conducted a carefully designed set of three international comparative studies under the title of Second Information Technology in Education Study (SITES) from 1997 to 2008, with data collection in 1998 (SITES-M1), 2001 (SITES-M2) and 2006 (SITES 2006) respectively. It is to the credit of the HK Quality Education Fund that it has the foresight to fund the applicant in conducting the Hong Kong component of all three SITES modules. SITES-M1 was conducted in 1998, when the implementation of the first IT in Education Strategy had barely started. The QEF panel's feedback to the applicant at the time was that the SITES-M1 study should provide crucial data for Hong Kong in charting the progress and impact of the First Strategy, and that the dissemination of the study findings should focus on providing feedback to schools and teachers on policies and practices that would improve ICT integration in schools. Since then, we have embraced these guidelines throughout the SITES studies.

All three SITES studies have contributed research findings and critical insight on the way forward for ICT integration in Hong Kong schools within the broader education context. For example, the SITES-M1 findings reveal that pedagogical practices in Hong Kong classrooms were the most traditional amongst the 26 participating countries according to the survey responses of the principals, that ICT-related professional development provisions in Hong Kong were largely technically oriented, be they for teachers or for principals. The SITES-M2 results show that the innovativeness of the selected case studies from Hong Kong were comparable to the most advanced cases in the international sample in terms of teachers' pedagogical approaches and roles, but were all isolated cases without connection to other schools or the wider community beyond the school walls. This study also found that in other countries such as Finland, where the cases demonstrate high connectivity, the innovations were more sustainable and transferable. These findings led to the following recommendations: strengthen the pedagogical focus for professional development provisions for teachers, include e-leadership development as one strategic focus for enhancing ICT implementation in schools and build professional innovation networks of teachers for the scaling up of good practices of ICT in education. All these recommendations were adopted in the Second IT Strategy in Hong Kong. The SITES 2006 results indicate that between 1998, the pedagogical approaches adopted by teachers as reported by principals have increased significantly, and is the biggest increase reported among all the 15 countries that participated in both studies. This and other SITES 2006 research findings show that the First and Second Strategy has contributed much to Hong Kong's advances in ICT integration in school education not only with reference to its own baseline in 1998, but also in comparison to international benchmarks as reflected through the international comparative data.

In putting together a final deliverable for the SITES 2006 study, we have taken the liberty to not only report on the SITES 2006 results for Hong Kong, but to make use of research findings from the previous two SITES modules and other evaluation studies of IT implementation in Hong Kong to undertake a review of the policy changes and impact of ICT implementation in Hong Kong schools since 1998. The result is a book, titled *The Changing Face of Education in Hong Kong: Transition into the 21st century*. Mr. Kenneth Chen, the Under-secretary for Education, succinctly expresses the value of this publication and Hong Kong's participation in all three SITES modules in the foreword he wrote:

A critical review of what Hong Kong has accomplished over the past three IT strategies in education, as contained in this book, is most timely. The four sets of research questions, aptly framed, are also what teachers, parents, and policy makers want answered.

I hope this book will inspire the next generation of educators, from school leaders to front-line teachers, to think deeply how technology can be better used as a "powerful lever for change" as we strive to sustain the hard-earned progress in education reform that we have achieved so far. In turn, policy makers should take stock of the research evidence in order to craft better policies to support the continued growth of ICT in education. I believe that ICT has been, and will remain our important ally for change.

While the SITES studies have provided critical data and insight on various aspects of ICT implementation and its impact on teachers' pedagogical practice, it has not been able to address a most critical question: what impact has the use of ICT in the school curriculum made on students' learning outcomes. Now, the IEA has accumulated sufficient knowledge and expertise to address the methodological challenges of assessing students' computer and information literacy skills and is currently inviting member countries to participate in ICILS, which is the comparative study on IT in education to follow SITES. In the Third IT in Education Strategy that is currently underway, the focus is on enhancing students' learning outcomes through e-learning, and developing students' information literacy skills has been a key strategic goal of the Second and Third Strategies. If this proposal for Hong Kong to participate in ICILS is accepted, the research results will provide international benchmarks that will allow us to understand where Hong Kong stands in terms of the students' abilities to meet the challenges of life in the 21st century, and what are the key factors that influence students' CIL outcomes.

2. About the International Computer and Information Literacy Study (ICILS)

The IEA International Computer and Information Literacy study (ICILS) is the first international comparative study of student preparedness for life in the information age—the ability to use computers to investigate, create and communicate in order to participate effectively at home, at school, in the workplace and in the community. The purpose of this study is to investigate, in a range of countries, the ways in which young people are developing computer and information literacy (CIL) to support their capacity to function in the digital age. This study is developed to address the increasing importance of ICT-related literacies for citizens to function effectively in the digital age, and the necessity for policy makers and education systems to better understand the contexts and outcomes of ICT-related education programs in their countries.

2.1 Overall conceptual design of ICILS

To achieve these goals, ICILS reports on student achievement in an authentic computer-based assessment of CIL. It also collects and reports on data about student background and about student use of computers and other digital media and their attitudes relating to use of computers and other digital tools to understand the broader context in which CIL is developed in young people. Contextual data will be collected from teachers, schools and education systems about the policies, resources and pedagogies in which CIL is being taught and learned. Figure 1 below provides a conceptual framework for the overall design of the Study, which is grounded on the assumption that students' learning outcomes are results of the interaction between curriculum implementation (including the pedagogical use of ICT) and various contextual factors at personal (micro), school (meso) and system (macro) levels.

2.2 Instruments included in the study

Based on the above conceptual framework, ICILS comprises five international instruments:

a. A student test of Computer and Information Literacy—This instrument measures the CIL learning outcomes achieved by the students. Each student will complete two 30-minute assessment modules. The modules include authentic computer based information literacy, management and communication tasks in a controlled online environment.

b. A 20-minute student questionnaire—The student questionnaire will be completed on-line and comprise questions about aspects of students' background (data on micro-level student factors), their use of computer technology (data on implemented curriculum) and attitudes towards the use of computer technology (data on non-cognitive learning outcomes).

c. A teacher questionnaire—The on-line teacher questionnaire will ask about teacher use of computers at school and outside school (data on implemented curriculum and meso-level factors) and about self-reported competency in using computers (data on micro-level teacher factors).

d. A school questionnaire—The on-line school questionnaire to be completed by the school principal will ask about computing resources and policies and practices regarding the use of information technologies at the school as well as school characteristics (data on meso-level factors, including school vision, leadership practices, ICT infrastructure, etc.).

e. A national context survey of ICT education—The on-line national context survey will collect information on the participating education systems including policies, initiatives, infrastructure resources and practices relating to ICT education in schools (data on macro-level factors).
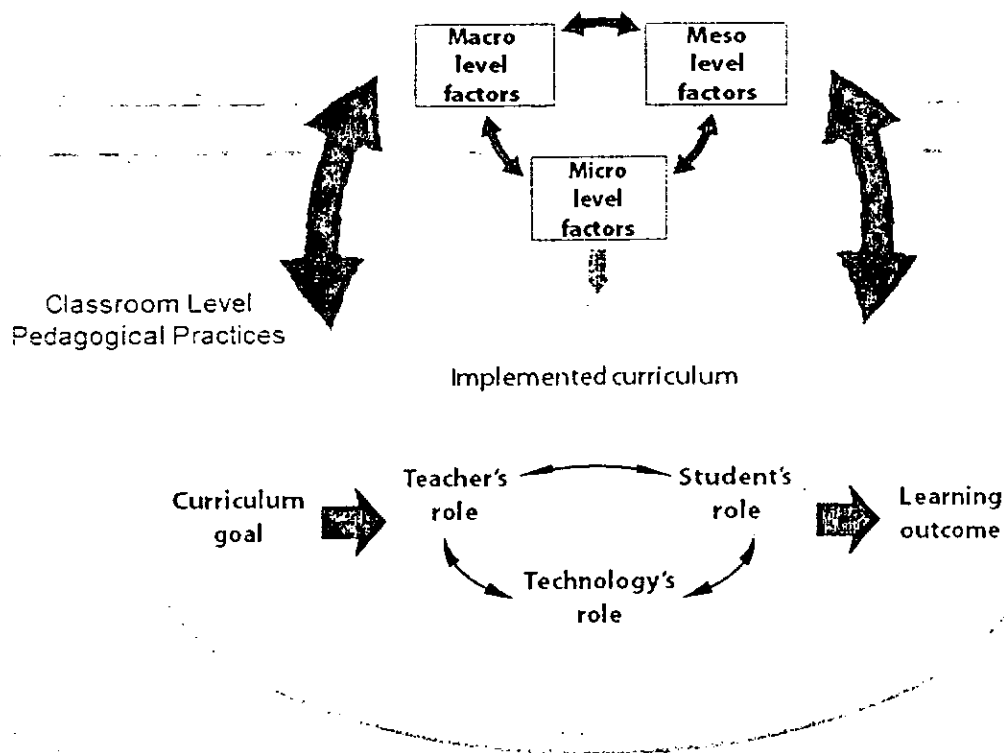

Figure 1. Conceptual framework for the overall design of the ICILS study.

2.3 The ICILS assessment framework, task design and mode of delivery

As the focal objective of this study is to assess students' CIL learning outcomes, of the five instruments listed above, instrument a, the student test of Computer and Information Literacy (CIL) is the most important. It is the most demanding in terms of innovativeness and rigor in the whole research design and

is also the most challenging in terms of its delivery to ensure that the assessment is conducted in a uniform and fair manner. The CIL construct underpinning the design of the student test is divided into two strands, each of which contains three constituent elements, as presented in Figure 2. The first strand—collecting and managing information—focuses on the receptive elements of information processing including the fundamental generic skills and understandings associated with using computers. The second strand—producing and exchanging information—focuses on students' use of computers as productive tools for thinking, creating and communicating.

Altogether three test modules will be developed, and each student test will comprise two out of the three modules based on a rotation design. Each test module consists of a set of linked questions and tasks contextualized by an authentic theme and driven by a plausible narrative such that it will simulate common sets of tasks in situations that can be reasonably expected to be experienced by students in within- and out-of- school contexts. The assessment will all be computer-based, comprising three types of item formats:

i. Computer technology is used only to present stimulus material and to capture the answer;
ii. Students are required to complete an action using software simulations of generic or universal applications in response to an instruction and their action is recorded;
iii. Students are required to modify and create information products using authentic computer software applications, which no student will have used before but which follows common software conventions. In this format, students' work is automatically saved for subsequent scoring by raters according to a prescribed set of criteria.

There are several possible methods of test delivery depending on the actual ICT infrastructure in the schools sampled. The IEA recommends two possible delivery methods: local operation delivery method by USB memory stick or delivery through Internet connection from the school to a server farm. The advantage of the former is that it avoids the difficulties associated with Internet connectivity and the logistics and expense of establishing server farms around the world in all the participating countries, and the potential problem of educational systems or schools preventing project servers being connected to school computer networks. However, this method is more costly in terms of efforts involved in collation and management of the collected data. The latter method involves using a thin client that works from memory stick without any installation to the local computer. This method requires sufficient bandwidth at the school level and establishing a server farm in the country level, but offers a more secure and easily managed way of data collection. Both involve costs in the fabrication/duplication and delivery of USB sticks.
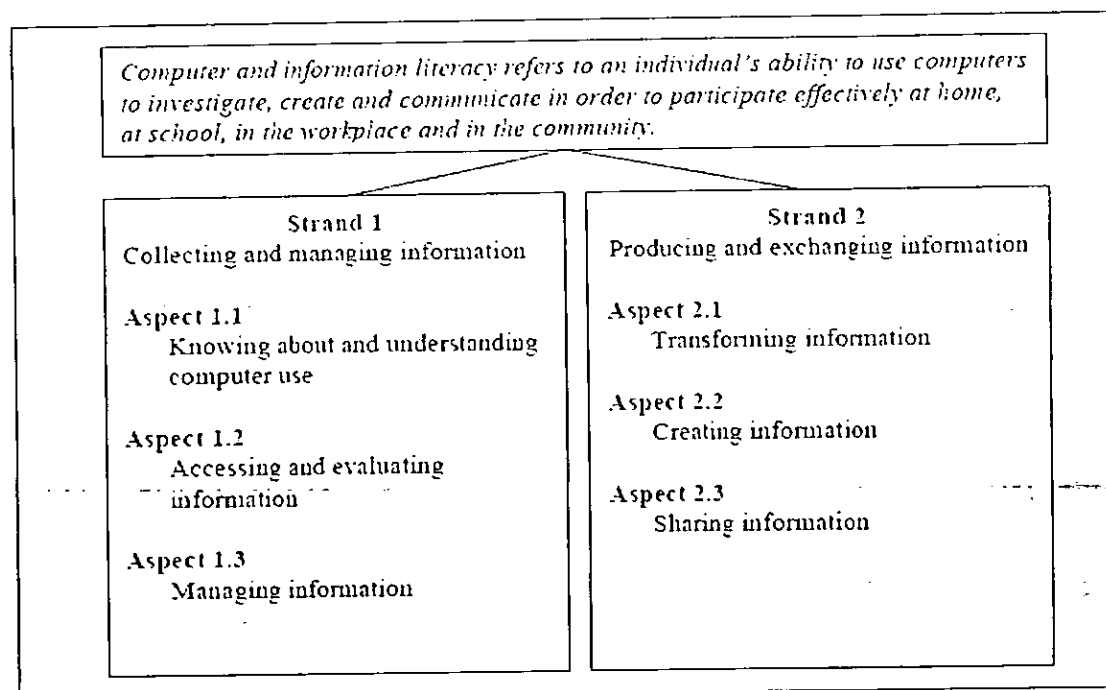
Figure 2. Conceptual structure of the proposed ICILS Computer and Information Literacy construct.

2.4 Populations and Sampling

The focal population of students to be surveyed in ICILS is the population of all students enrolled in the grade that represents eight years of schooling, counting from the first year of ISCED Level 1, provided the mean age at the time of testing is at least 13.5 years. In the case of Hong Kong, this is equivalent to secondary two. In addition, countries can have an option to participate in an additional assessment of Grade 4 students. It is proposed that Hong Kong also participates in this optional study.

Sampling will be based on a two-stage cluster design. Sample sizes will be determined according to the sampling efficiency based on information from other national and international surveys in related domains. At the school level a minimum sample size of 150 schools would be drawn for each country using PPS (probability proportional by size) sampling procedures. For the sampling of students within schools, a fixed number of 20 eligible students from across the target year level at each sampled school will be sampled to participate in the study. For the teacher survey, 15 randomly selected teachers of the target grade in each school will be sampled.

2.5 Survey design to support longitudinal comparison with SITE data

The design of the survey instruments c to e as listed in section 2.2 will reference the respective instruments used in the previous SITES studies, particularly those used in SITES 2006, to ensure that longitudinal comparisons of key parameters can be conducted between the ICILS and the SITES studies.

2.6 Research questions addressed by ICILS

ICILS is designed to address four key research questions:

1) What variations exist between countries, and within countries, in student computer and information literacy?

2) What of the following aspects of schools and education systems are related to student achievement in computer and information literacy: (a) general approach to computer and information literacy education; (b) school and teaching practices regarding the use of technologies in computer and information literacy; (c) teacher attitudes to, and proficiency in, using computers; (d) access to ICT in schools; and (e) teacher professional development and within school delivery of computer and information literacy programs?

3) What characteristics of students' backgrounds, levels of access to, familiarity with and self-reported proficiency in using computers are related to student achievement in computer and information literacy, and (a) how do these characteristics differ among and within countries; (b) to what extent does measured computer and information literacy correlate with self-reported proficiency in ICT; and (c) does the strength of this correlation differ among countries and groups of students?

4) What aspects of student personal and social background (such as gender, socioeconomic background, and language background) and familiarity with computers are related to computer and information literacy?

3. Goals and Objectives

Project goals

There are three main goals in this proposal for Hong Kong to participate in ICILS:

1. To benchmark Hong Kong students' computer and information literacy (CIL) skills and pedagogical use of ICT in Hong Kong classrooms using the international comparative data collected from ICILS.
2. To identify the macro-, meso-, micro- and classroom implement characteristics that contribute to Hong Kong students' achievement in CIL, and to explore the similarities and differences between Hong Kong and other participating countries in these characteristics and their relationships with students' CIL outcomes.
3. To disseminate the research findings in ways that will contribute to evidence-based policy decisions related to ICT in education at system and school levels, and to professional development for teachers on methods of assessing CIL and on ways to enhance students' CIL skills based on the ICILS findings.

Project objectives

1.   To compile sets of international benchmarks for students' CIL and school/classroom level factors related to pedagogical use of ICT in and outside of classrooms using the data collected from ICILS.

2.   To compare the statistics of the data collected from Hong Kong against the corresponding international benchmarks to establish a comprehensive picture of the level of Hong Kong's achievement in students' CIL and pedagogical integration of ICT in an international context.

3.   Using statistical modeling methods, to identify the relationship between macro-, meso-, micro-, and classroom level factors and their contribution to Hong Kong students' CIL achievement.

4.   To examine the findings on factors influencing students' CIL achievement from the international report, and to recommend, on the basis of comparison with findings from objectives 1 to 3 above, ways to improve Hong Kong students' CIL achievement through macro-level education policy and strategy, school level policy and strategy, class implementation and community support.

5.   To provide a report for each participating school (150 primary and 150 secondary schools will be sampled for each population to be studied) which details the school's results in terms of the students' CIL

achievement and other student, teacher and school level parameters collected through the surveys in comparison with the Hong Kong mean and the international mean.

6.   To develop disseminate materials targeting different sectors of the community—policy makers, school leaders, teachers, publishers, education software developers, students and parents—to inform them of the key findings and implications that are relevant for them, and to recommend courses of action to further improve students' CIL achievement.

7.   To launch a variety of dissemination activities, in partnership with QEF and different relevant organizations and community groups such as HKEdcity and professional education bodies to maximize the reach and impact of the research findings.

4. Needs Assessment and Applicant's Capability

4.1 Needs Assessment

All three IT in Education Strategies launched by the HKSAR government have identified enabling students to meet the challenges of the 21st century as its main policy goal. In the First Strategy launched in November 1998, two out of the vision statements in the document are:

- to develop in our students capabilities to process information effectively and efficiently; and
- to develop in our students the attitude and capability for independent life-long learning.

Unfortunately, our methods of assessment have not been developed to find out how far we have been able to achieve such visions. The Overall Evaluation Report on the implementation of the First Strategy published by the HK Polytechnic University states *"...if we really want to use IT to promote student-centred learning the assessment has to be not limited to the current structure .... need to look at alternative forms of assessment that are more conducive to student-centred, IT-based activity."* (Kwan et al., 2005, p. 329)

As part of the implementation of the Second IT Strategy, the EDB has commissioned two consultancy studies on information literacy (IL), one on developing an IL framework for student learning appropriate to different KLAs at different key stages (EMB, 2005), and the other one on teachers' IT training framework for teachers (JCST, 2007) to be able to help students achieve the desired IL skills through learning in the curriculum. As part of the evaluation of the Second Strategy (Law, Yuen, Shum, & Lee, 2007), Primary 5 and Secondary 2 students studying in local Hong Kong schools were randomly sampled to take part in a performance assessment of their IL skills. The results of this Study indicate that *"Students have generally gained some basic IT operational skills but are very poor in tackling the more complex tasks involving information literacy skills in integration, evaluation, create and communicate. The findings also indicate that learning experience in school matters in terms of students' IL achievement and that here is still a long way ahead between ICT use in classrooms and nurturing 21st century skills in students in Hong Kong"* (European Commission, 2009, p. 161). Since then, the EDB has been implementing efforts to provide teachers with resources and professional development opportunities for promoting and assessing students' IL skills. However, to date, there is no benchmarks or publicly available tools for assessing students' IL outcomes, both in Hong Kong and internationally.

At the international level, there has been a growing interest and demand for valid ways of assessing students' information literacy achievement as a core part of 21st century skills, in parallel with the many education reforms that are underway to prepare students for life in the digital age. This need is clearly captured in the project homepage of ATC21S (Assessment & Teaching of 21st Century Skills), which is an international project with six founding countries (Australia, Finland, Portugal, Singapore, United Kingdom and USA) and sponsored by Cisco, Intel and Microsoft:

"The ways in which we live, work, play and learn have been transformed by technologies. People access, use, and create information very differently from the way they did in previous decades. People of the 21st

century need new skills and education has an important role in developing them. This initiative is focused on defining those skills and developing ways to measure them using information technology. It will address the pedagogical implications and provide evidence on how the skills can best be developed in education."

The European Commission has also recently published an edited volume titled *Assessing the effects of ICT in education: Indicators, criteria and benchmarks for international comparisons*, and its introduction clearly highlighted the need for such assessments:

Despite the fact that education systems have been heavily investing in technology since the early 1980s, international indicators on technology uptake and use in education are missing. For more than 25 years education systems have been able to design and implement policies in this domain without those indicators,......

Øystein Johannessen of the Norwegian Ministry of Education and Research wrote in the same volume:

[There is a] need for developing an open, flexible and international knowledge base for ICT in education, in which joint development of benchmarks can play a key role for addressing complexity, multi-stakeholder interests and international comparisons. ......

The mounting of the ICILS study by IEA is the result of much international commitment and efforts to address the need to establish some international benchmarks for CIL achievement. If Hong Kong misses this opportunity to participate in such an important study, we will lose this valuable chance to learn about the impact of Hong Kong's IT in Education strategy and Education Reform efforts on students' ability to make use of IT for lifelong learning in comparison with other countries around the world. Such studies take a long lead-time to develop and implement. The IEA ICILS research team started work about two years ago. Data collection will be done in 2013 and the first international report is expected to be released in 2015. If Hong Kong misses this opportunity, we will probably have to wait for another 8 to 10 years before another such opportunity will come round again.

The ICILS study comprises a main study on grade 8 students and an optional study on grade 4 students. Hong Kong's IT in education strategy encompasses the entire school system from primary 1 to end of secondary. The need for participation in both populations of students is equally strong for the case of Hong Kong.

4.2 Applicant's Capability

The applicant, the Division of Information and Technology Studies (ITS) is an academic division within the Faculty of Education, University of Hong Kong. Its staff members have been providing guidance and leadership to various large scale research projects related to IT in education hosted under the Centre for Information Technology in Education (CITE). The project leader for this proposal is Professor of IT in Education in this Division and the Director for CITE. In this project proposal, CITE will collaborate with the applicant to provide research support to the project. CITE has strong expertise, experiences and track record in conducting comparative research in the field of IT in education, including both quantitative and qualitative studies, and in the dissemination of research findings for the purposes of professional and leadership development. CITE also has excellent track record in conducting studies related to IT in education and students' computer and information literacy skills. For the former, CITE and ITS have successfully conducted the three modules of SITES (SITES-M1, SITES-M2, and SITES 2006) under three previous grants funded by QEF. Regarding the latter, CITE was commissioned by the EDB to conduct the *"Phase (II) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007)"* on February, 2006. In this study, the project team developed online performance assessment and corresponding rubrics for the purpose of assessing students' information literacy in three KLAs—Mathematics, Chinese language and Science. In 2007, CITE was also commissioned by Microsoft as an evaluation partner for the Microsoft Innovative Schools Program (ISP) in Hong Kong. This project was to evaluate the Hong Kong ISP school's efforts in learning and teaching

innovations and their impact on students' 21st century skills. In 2009, CITE was commissioned by the EDB to conduct "_Development of Evaluation Tools for Assessing Students' Information Literacy and Promoting Information Literacy among Students_". In this last project, the project team developed assessment tools for teachers, and for self- and peer- assessment by students on information literacy skills in the science KLA at key stages 1 to 3.

It should be noted that ITS and CITE have been able to successfully implement the above projects because of the expertise they are able to draw from its excellent international network and the strong steering committees that were set up for these projects, which include members from different institutions and professional backgrounds, such as EDB officers, principals, teachers and researchers. The applicant will leverage the same and set up a steering committee comprising EDB officers from relevant sections, school principals, teachers, and teacher educators once the project is approved by QEF.

5. Targets and expected number of beneficiaries (Extent of teachers' and principals' involvement in the project)

The intended audience of this project includes policy makers, teacher educators, principals and teachers in primary and secondary schools, publishers, education software developers, parents and students. As mentioned in the section on goals and objectives, we will develop dissemination materials that will communicate clearly to each of the above groups of stakeholders the relevant key findings as well as the associated implications and recommended follow-up actions such that Hong Kong's participation in ICILS will be beneficial to developing community-wide strategies and efforts to improve our students' CIL skills.

We will involve principals and teachers, including those from Centre of Excellence schools engaged in curriculum and assessment innovations for promoting students' IL, through formal membership in the project steering committee and informal contacts and partnership arrangements. Inputs from principals and teachers will be sought on the following:

- Research design – there is an opportunity for each participating country to include a small number of items in the survey instruments to address national/system level questions. Principals and teachers will be consulted on questions to include as national options;
- Ways to improve the participation rate of the sampled schools;
- Specific information to be included in the report to each participating school and its format;
- The format and content for the dissemination materials to different stakeholder groups;
- The format and co-organizing partners for dissemination activities on the ICILS findings.

6. Implementation Plan with Time-line

Timeline of project implementation:

Project period	Project activities
Jun 11 – Dec 11	• Communicate with IEA & ICILS Study Centre to arrange for HK's participation • Formation of steering committee • Review and provide feedback on assessment questions and survey materials • Identify HK specific research questions and to develop appropriate items • Collect information in preparation for national context survey • Assemble information in preparation for in-country sampling, finalize national sampling plan and submit sampling forms • NRC Meeting 3 to finalize field trial assessment content and field operations • Translate research instruments, verify the accuracy of the translated instruments

Project period	Project activities
	• Conduct in–country technical pilots of test delivery system in country • Finalize and test field operations procedures including instrument delivery • Survey operations, data management & scorer training for field trial in Hamburg
Jan 12 – Feb 12	• Finalize translated instruments, upload survey instruments to DPC online system • Complete final technical trials of field operations and instrument delivery, field trial preparation
Mar 12 – May 12	• Conduct field trial
Jun 12 – Feb 13	• Compilation, cleaning and analysis of field trial data • Refinement of the research instrument • NRC Meeting 4 to finalize main survey assessment content and field operations • Main survey preparation and confirmation of participation of sampled schools • Main study survey operations, data management & scorer training in Hamburg • Final preparation and testing of technology platform for testing and data collection
Mar 13 – May 13	• Conduct Main Study
Jun 13 – Nov 13	• Scoring of student work ….
	• Data preparation and data cleaning • Submit online response to national context survey
Dec 13 – Oct 14	• Analysis of main survey data from Hong Kong • Preparation for Hong Kong local report • NRC Meeting 5 to report on main survey data and consideration of international report
Nov 14	• Release of international report • Internal release of international dataset for analysis by NRCs
Nov 14 – Mar 15	• Secondary analysis of international database to answer research questions for HK • Prepare study report for HK incorporating international findings
Mar 15	• Release of international database and technical report
Mar 15 – Sept 15	• Preparation of dissemination materials for different stakeholder groups • Release of Hong Kong ICILS report • Partner with QEF, EDB, HKEdcity and other community groups to organize press release, seminars and various activities for the dissemination of ICILS findings

7. Expected Deliverables and Outcomes

The main deliverables of the project include:

1. A report of the HK ICILS results and key international findings to address project objectives 1 to 4.
2. One tailor-made report to EVERY participating school, which details the school's results in terms of the students' CIL achievement and other student, teacher and school level parameters collected

through the surveys in comparison with the Hong Kong mean and the international mean. Apart from this, the strength and weakness of individual schools' students' performance will also be reported so as to help the school to plan for their further development in enhancing students' CIL. If school has any problems in interpreting the results, they can also approach the research team via e-mail or telephone hotline.

3. A press conference to disseminate the research findings derived from the main study to the public.

4. Customized sets of dissemination materials, each targeting a different stakeholder group—policy makers, school leaders, teachers, publishers, education software developers, students and parents—to inform them of the key findings and implications that are relevant for them, and to recommend courses of action to further improve students' CIL achievement.

5. At least two workshops for both primary school level and secondary school level which aimed at helping those participating schools to interpreted the research result and for teachers on ways to assess students' CIL outcomes and how to tailor teaching and learning to enhance students' CIL.

6. Seminars and workshops for teachers on ways to assess students' CIL outcomes and how to tailor teaching and learning to enhance students' CIL.

7. Dissemination activities targeting for school leaders, publishers, education software developers and parents to enable them to understand the ICILS findings and the implications for them.

8. A website to disseminate the research findings and developed resource materials to the public.

Budget for ICILS

		24 Jun 11 - 23 May 12	24 Jun 12 - 23 May 13	24 Jun 13 - 23 May 14	24 Jun 14 - 23 May 15	24 Jun 15 - 23 Sept 15	Total (HK$)
I	**Staff cost (Remark 1)**						
a.	Project Manager (research officer scale, from Jun 2011 to Aug 2015) -HK $37,945 per month (MPF inclusive) x 51 months	455,340	455,340	455,340	455,340	113,835	1,935,195
b.	Research Assistant I (from Mar 2012 to Dec 2014) HK$16800 per month (MPF inclusive) x 34 months	50,400	201,600	201,600	117,600	0	571,200
c	Helpers for preparing, delivery and collection of USB memory sticks - $50 / hr (MPF inclusive; 180 hr for field trial, 600 hr for main study)	9,000	30,000	0	0	0	39,000
d	Helpers for data transfer from USB memory stick data to server - $50 / hr (MPF inclusive; 90 hr for field trial, 450 hr for main study)	4,500	22,500	0	0	0	27,000
e	Part-time RA (teachers) to help with scoring of assessment (20 scripts per school, 60 schools for field trial and 300 schools for main study) - $95 / hr (MPF inclusive; 600 hr for field trial, 3,000 hr for main study)	0	57,000	285,000	0	0	342,000
	Sub-total (I)	519,240	766,440	941,940	572,940	113,835	2,914,395
	Project budget roundup Final Sub-total (I)						2,914,457
II	**Services**						
a.	Web design - $900/layout, estimated no. of webpages: 10	9,000	0	0	0	0	9,000

b.	Web update and maintenance - $900/layout, update 3 pages per year (start from 2nd year) - server backup & maintenance: $150/month (start from 1st year)	1,800	4,500	4,500	4,500	3,150	18,450
c.	Web design for dissemination - include web design for more than 10 pages	0	0	0	0	10,000	10,000
d.	Technical platform & USB customization, checking & trouble-shooting in schools - $150 per hour (field test: 60 schools; main study: 300 schools)	18,000	90,000	0	0	0	108,000
e.	Preparation of USB, training and supervision of helpers - $200 / hour (10 hours for field trial, 30 hr for main study)	2,000	6,000	0	0	0	8,000
f.	Technical support for setting up server and students' assessment test / online survey questionnaire	5,000	3,000	0	0	0	8,000
g	Administration service charges by HKU (CITE) (Remark 2)	62,139	67,970	51,113	3,080	23,986	208,288
h	External auditor's report on expenses upon completion of project	0	0	0	0	35,000	35,000
	Sub-total (II)	97,939	171,470	55,613	7,580	72,136	404,738
III	**Computer Equipment & licenses**						
a.	2 set of desktop computers	12,000	0	0	0	0	12,000
b.	3 notebook computers for trouble-shooting in schools / DHCP server	8,500	17,000	0	0	0	25,500
c.	Data server with software and peripherals for the assessment platform	40,000	0	0	0	0	40,000
d.	Uninterrupted power supply (UPS)	0	7,000	0	0	0	7,000
e.	backup storage	0	10,000	0	0	0	10,000
f.	Backup software agent	0	5,000	0	0	0	5,000
g.	Analytical software and other computer software for processing data and website creation						
	- SPSS ($150 per year per computer)	300	300	300	300	300	1,500
	- HLM (US$ 425 + US$ 65 for shipment)	0	0	3,822	0	0	3,822

	- Lisrel (US$ 495 + US$ 65 for shipment)	0	0	4,368	0	0	4,368
	- MS windows server ($3,000)	3000	0	0	0	0	3,000
	- MS windows & office ($400 per year)	1200	1200	1200	1200	1200	6,000
	- Adobe for website creation (US $1,500)	11,700	0	0	0	0	11,700
h.	USB memory stick - 4GB ($100 / USB memory stick)	8,000	22,000	0	0	0	30,000
	Sub-total (III)	*84,700*	*62,500*	*9,690*	*1,500*	*1,500*	*159,890*
IV	**General Expenses**						
a.	Costs for job advertisements	3,000	3,000	3,000	2,000	0	11,000
b.	Travelling expenses for data collection - $60 per people, 3 staffs per study (30 schools for pilot study; 60 schools for field trial; 300 schools for main study)	16,200	54,000	0	0	0	70,200
c.	Travelling expenses for attending 2 training provided by the IEA DPC - for project and survey operations and scoring training	15,000	15,000	0	0	0	30,000
d.	Attendance costs for 3 NRC meetings - Each meeting will be attended by 1 staff	20,000	20,000	0	20,000	0	60,000
e.	Costs for publishing the final local report, production of individual school reports and different forms of disseminations materials -$20,000 for proof-reading; $5,000 for book cover design and page-making; $200,000 for printing; $40,000 for the postage of the book	0	0	0	0	265,000	265,000
f.	General expenses for organizing surveys, photocopying, printing, postage and other miscellaneous costs	8,000	8,000	8,000	8,000	8,000	40,000
g.	Costs for organizing dissemination activities	0	0	0	8,000.00	20,000.00	28,000
	Sub-total (IV)	*62,200*	*100,000*	*11,000*	*38,000*	*293,000*	*504,200*
V	**International Participation Fee**						

a.	International participation costs for main study - Total: US$ 75,000 + EUR$ 75,000 (=HK$1,410,000 based on currency conversion rate from USD & EUR to HKD at 7.8 and 11 respectively) - can be paid by three annual installments	470,000	470,000	470,000	0	0	1,410,000
b.	International participation costs for optional study - Total: US$ 37,500 + EUR$ 37,500 - can be paid by three annual installments	235,000	235,000	235,000	0	0	705,000
	Sub-total (V)	*705,000*	*705,000*	*705,000*	*0*	*0*	*2,115,000*
VI	**Contingency**						
		28,495	31,169	23,439	1,412	10,999	95,515
	Sub-total (VI)	*28,495*	*31,169*	*23,439*	*1,412*	*10,999*	*95,515*
	-	-	-	-	-	-	-
	Total per year (I+II+III+IV+V+VI)	1,497,574	1,836,579	1,746,682	621,432	491,470	6,193,800
Explanatory Remarks							
(1)	The full-time project staff will receive a fixed salary throughout the entire project period.						
(2)	Administration service charged by CITE, HKU (Administration Overheads)=(total of actual cost in services + computer equipment & licenses + General expenses + international participation fee)*7% . This service charge is to pay for bookkeeping and management reporting, staff recruitment and retention, tendering and purchasing of equipment and supplies which will be conducted by CITE, HKU.						

8.1 Budget Justifications

Staff costs

The ICILS study is a large scale international comparative study which includes: (1) the design of research instruments including national context questionnaire, principal questionnaire, teacher questionnaire, student questionnaire, and students' CIL skills tests; (2) developing the sampling plan for approval by the ICILS Study Centre and implementation of the plan; (3) the translation of research instruments, (4) onsite data collection related to students' CIL performance from at least 150 secondary schools for the main study; (5) onsite data collection related to students' CIL performance from primary schools for the optional study; (6) the scoring of students' CIL tests; (7) the administration and data collection for the four survey questionnaires; (8) there are two rounds of data collection involved in tasks 2 to 6—the field trial and main study; (9) data preparation, data cleaning and analysis for each of the two sets of collected data to yield basic descriptive statistics, (10) further secondary analysis and reporting of the research findings to address the set research objectives; and (11) design and disseminate research findings to different stakeholder groups.

All of the above require that the project manager has highly specialized statistical skills as well as mature project management skills. This person will be responsible for liaising with researchers in the IEA headquarters, the ICILS Study Centre at Melbourne (ACER) and the IEA Data Processing Centre at Hamburg. This person will also be responsible for liaising with other NRCs and their project teams to explore in-depth comparisons with selected countries. The project manager will also take on the responsibilities for editing and translating of the research instruments, survey administration in schools, monitoring and quality control of the data collection, adaptation of codebooks and supervises data cleaning and data verification, training of scorers, management and monitoring of the scoring process, data analysis, report writing, organization of dissemination workshops and seminars. Thus, this person must have strong managerial skills, excellent communication skills in written Chinese and English, solid knowledge in the area of ICT in Education in Hong Kong, extensive quantitative research experience, and ability to work independently. The candidate therefore needs to possess a PhD in education measurement or related fields as well as experience in managing large-scale quantitative studies. The position needs to be costed at the second salary point on the Research Officer scale in order to attract appropriately qualified candidates. This project manager has to be hired on a full time basis throughout the project duration.

As the data collection has to be conducted at a very large scale to meet the sampling requirements for a representative random sample , research assistant needs to be hired. A research assistant (RAI, preferably with a Master degree in education or the social sciences) will be hired at the point when the field trial starts and will be hired until the publication of the International Report to support the data analysis and reporting. The assistant will take responsibility for contacting and coordinating with schools and teachers, take care of the logistics of the data collection, preparation, cleaning and basic analysis of the performance assessment and survey data. He/she will also assist the research officer in constructing an international database for the collected data, implementing data analysis procedures as instructed and to assist in the preparation of the various reports and dissemination materials.

In addition to the full time staff, there is a need for additional part-time support for various tasks related to preparation for data collection, actual data collection and for scoring of the students' work. As recommended by the IEA, scoring will take approximately 25 person days for the Field Test and 125 person days for the main survey. For the optional study, we expected that a similar number of manpower are needed as the number of schools and teachers participated will be similar to that number of participants for the main study.

Computer Equipment and Licenses

To help smoothly and successfully implement the project, there is a need to purchase a minimum of two desktop computers and three notebook computers. The desktop computers will be used by the full-time

project staffs including the research officer, two research assistants. The notebook computers will mainly be used as a mobile DHCP servers for data collection and for use in trouble-shooting in the sampled primary and secondary schools sampled for participation in the field trial and main study respectively. Having considered the narrow time window for data collection, the project team will divide into three separate teams to conduct on-site data collection. Hence three notebook computers are necessary. An uninterrupted power supply and a data server with software and peripherals for the assessment platform are needed for hosting the online survey data collection, archiving of the performance assessment data, online scoring of students' test scripts, hosting the project website and the dissemination website.

Taking account of the limited amount of time for conducting data collection, we estimate that we need to prepare a stock of a minimum of 300 USB memory sticks for use in the performance assessment in the main study. This number is estimated by assuming that we may need to collect data from 10 schools per day, each of which will have 20 students. Also, the USB memory sticks may fail to function due to heavy reuse rate (we may need to use around 3000 times for the main study and 3000 times for the optional study). Thus, we propose to prepare 50% more memory sticks for replacement. As a result, a minimum of 300 USB memory sticks are needed.

Services

There is a need to purchase services for web design, web updating, and the development of dissemination website, as such activities are useful for disseminating the output of the project to the public. Since the project team needs to conduct on-site data collection using USB memory sticks, there is a need for technical support in USB memory stick customization, server setup and on-site troubleshooting. Also, technical supports during the process of transferring the collected data from the USB memory stick to the server, updating the information in students' assessment test and online survey questionnaire are also needed in order to ensure that the project can be run smoothly. In accordance with QEF Guidelines, for the purchase of goods, equipment and the procurement of services including consulting services with a value –

(a) over $5,000 but not exceeding $50,000, a minimum of two verbal or written quotations should be obtained;

(b) over $50,000 but not exceeding $1,430,000, at least five written quotations should be obtained; and

(c) over $1,430,000, a competitive tendering procedure should be adopted.

The service provider also needs to maintain a close collaboration with the IEA and have a good understanding of the requirements for international comparative research.

In addition, the administrative services include the processing of applications and appointments, tendering and purchasing of equipment and supplies handled by HKU (CITE).

General Expenses

This project is an international project organized by the IEA. In order to conduct international comparison of the project findings, the IEA will organize three NRC meetings to discuss issues related to project management, planning, instrumentation implementation and reporting. Such meetings will be held in different countries. Attending these meetings are essential as such meetings will determine the instruments which will be used for data collection, how data will be collected and analyzed, etc. Besides, there are two training meetings to be held in the IEA Data Processing and Research Center in Hamburg on project operations, data management, scorer training and technical training for implementing the project (one for the field trial and one for the main survey). Attendance at these two meetings are essential to ensure that data collection, cleaning and verification will be carried out strictly according to the IEA requirements, which are necessary for the data to be internationally comparable. To minimize the amount of budget needed for the meetings, we will only send one project staff to attend each of these meetings.

We have also budgeted for project dissemination activities, including organizing seminars and press conference, as well as publishing the final report before the completion of the project. Such activities are particular important to the policy-makers, curriculum developers, principals, teachers and teacher educators, as findings from the study can provide some insight on our students' capabilities in CIL.

9. Asset Usage Plan

The Grantee should plan the deployment of assets that cost $1,000 or more per item upon project completion.

Category	Item / Description	No. of Units	Total Cost	Proposed Plan for Deployment(Note 1) & Justification(s) (Note 2)
Computers	Desktop computers	2	12,000	*For use by the Faculty in other QEF/research projects. To fully utilize the existing resources*
	Notebook computers	3	25,500	*For use by the Faculty in other QEF/research projects. To fully utilize the existing resources .*
	Data server with software and peripherals for the assessment platform	1	40,000	*For use by the Faculty in other QEF/research projects. To fully utilize the existing resources*
	Uninterrupted power supply (UPS)	1	7,000	*For use by the Faculty in other QEF/research projects. To fully utilize the existing resources*
	USB memory stick - 4GB ($100 / USB memory stick)	300	30,000	*Consumable*
Analytical software and other computer software for processing data and website creation	-HLM (US$ 425 + US$ 65 for shipment)	1	3,822	*For use by the Faculty in other QEF/research projects. To fully utilize the existing resources*
	- Lisrel (US$ 495 + US$ 65 for	1	4,368	*For use by the Faculty in other*

	shipment)			QEF/research projects. To fully utilize the existing resources
	- Adobe for website creation (US $1,500	1	11,700	For use by the Faculty in other QEF/research projects. To fully utilize the existing resources

10. Report Submission Schedule

The grantee 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 24/6/2011 - 30/11/2011	31/12/2011	Interim Financial Report 24/6/2011 - 30/11/2011	31/12/2011
Progress Report 1/12/2011 - 31/5/2012	30/6/2012	Interim Financial Report 1/12/2011 - 31/5/2012	30/6/2012
Progress Report 1/6/2012 - 30/11/2012	31/12/2012	Interim Financial Report 1/6/2012 - 30/11/2012	31/12/2012
Progress Report - 1/12/2012 - 31/5/2013	30/6/2013	Interim Financial Report 1/12/2011 - 31/5/2013	30/6/2013
Progress Report 1/6/2013 - 30/11/2013	31/12/2013	Interim Financial Report 1/6/2013 - 30/11/2013	31/12/2013
Progress Report 1/12/2013 - 31/5/2014	30/6/2014	Interim Financial Report 1/12/2013 - 31/5/2014	30/6/2014
Progress Report 1/6/2014 - 30/11/2014	31/12/2014	Interim Financial Report 1/6/2014 - 30/11/2014	31/12/2014
Progress Report 1/12/2014 - 31/5/2015	30/6/2015	Interim Financial Report 1/12/2014 - 31/5/2015	30/6/2015
Final Report 24/6/2011 - 23/9/2015	24/12/2015	Final Financial Report 1/6/2015 - 23/9/2015	24/12/2015

11. Evaluation Parameters and Method

To ensure the quality of the project, we propose three broad aspects of quality assurance:

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(1) One important criteria for the quality of this research is whether it can meet all the stringent quality control criteria demanded by the ICC (International Coordination Centre), including the formation of the national/regional expert panel, the case selection and translation standard in order that the data from Hong Kong can be included for international comparison in the International Report. To allow the ICC to monitor and assure the quality of the research as it is conducted in the participating countries, Hong Kong has to fulfill the following tasks demanded by the ICC:

- To coordinate with the ICC on the design of research instruments and the online assessment platform for the study
- To attend the workshop/meetings held by the ICC on both data collection and data analysis
- To conduct pilot tests in which they try out data collection and analysis techniques and report on these to the ICC

(2) To ensure the project relevancy to schools' and teachers' needs, ICILS will set up a steering committee

Regular meetings would be held to monitor and evaluate the progress of the project. Implementation of the project will be fine-tuned if necessary based on the recommendations provided by the steering committee members. Such recommendations will also be discussed with QEF before we fine-tune the implementation of the project.

(3) The extent to which the dissemination materials and activities are found to be useful to the different stakeholder groups will be collected through surveys distributed to participants at the various activities and online channels.

12. Sustainability of the Outcomes of the Project

The outcomes of the project provide insight for the following parties, which can sustain the project impact after the completion of the project:

For policy makers

Findings from ICILS can help develop measurable indicators on the extent and impact of IT in schools, particularly in terms of students' CIL learning outcomes. These indicators would be valuable in evaluating and effectiveness of government policies and providing suggestions on its improvement. The research data collected across different countries in ICILS would provide internationally benchmarked indicators for the governments to understand better how HK stand in relation to other countries and to fine-tune the implementation strategies accordingly. These can be the basis for subsequent longitudinal studies. In addition, the online student performance assessment will introduce state-of-the-art methods of assessment, which can contribute to curriculum and assessment development at the educational policy level.

For schools

To sustain and enhance the project impact, ONE tailor-made report will be provided to EVERY participating school, indicating their students' IL skills status against international benchmarks. Each report provides useful information to its respective school in evaluating the extent of IT integration in schools, which helps school leadership in fine-tuning and improvement of policy and implementation strategies at the school level.

For teachers

The dissemination materials and website produced by the project will provide good concrete models of CIL assessment, an understanding of the strength and weaknesses of Hong Kong students' CIL skills in comparison with those in other countries, factors influencing students' CIL achievement and the implications for teaching and learning design for their improvement.

For parents and students

The dissemination materials will help parents and students to understand the strength and weaknesses of Hong Kong students' CIL skills in comparison with those in other countries, personal and contextual factors influencing students' CIL achievement and how these can be improved through efforts of the students and the parents.

For publishers and educational software developers

The dissemination materials will help publishers and educational software developers to understand the strength and weaknesses of Hong Kong students' CIL skills in comparison with those in other countries, factors influencing students' CIL achievement and the implications for teaching and how learning resources and learning tasks can be better designed to help students develop better CIL skills.

13. Dissemination / Promotion

The project team will partner with QEF, EDB and different community groups to disseminate the findings using the developed dissemination materials through a variety of formats: reports, booklets, leaflets, press release, workshops, seminars and public forums targeting different stakeholder groups.

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