

Project Details

Project title: The effectiveness of literacy intervention program for secondary students with dyslexia and specific reading and writing difficulties and significant underachievement.

Goals and Objectives: This project addresses the QEF special initiative on **Extended Education Programs for Students with Special Educational Needs**, in terms of developing different modes of training programs for junior secondary school students with dyslexia and specific reading and writing difficulties, through collaboration between schools and community organizations. The objective is to develop and evaluate an effective structured literacy intervention program conducted within a split-group mode in comparison to the usual provision in secondary schools (e.g. after-school tuition type program) for junior secondary school students with severe degree of dyslexia and specific reading and writing difficulties within the Three-tier model of support. The goals are: (i) to demonstrate that the learning of students with dyslexia and specific reading and writing difficulties may be enhanced through a split group program so they will catch up on underachievement in reading and writing abilities and on curriculum knowledge, to become more effective and competent students who are in pace with their peers; and (ii) to facilitate and empower schools and teachers to enhance the effective learning of students with dyslexia and specific reading and writing difficulties through curriculum planning and intervention design.

Short-term goals and objectives:

Short term Objective: To produce an indigenous structured literacy intervention program to enhance and facilitate the learning of junior secondary students with dyslexia and specific reading and writing difficulties in mainstream schools.

Short term Goals: Through the program, the following goals are to be achieved:

- The learning outcomes of students with dyslexia and specific reading and writing difficulties will be enhanced and they will become **effective, competent and confident** learners.
- Teachers and schools will be more **effective, competent and confident** in supporting and enhancing the learning of students with dyslexia and specific reading and writing difficulties.

Long-term goals and objectives:

Long term Objective: Produce robust research evidence to demonstrate the effectiveness of structured intervention programs to strengthen reading and writing skills and to support the learning of junior secondary students with dyslexia and specific reading and writing difficulties in the Hong Kong context.

Long term Goals:

- Building up of a database for evidence-based practice on strategies in supporting secondary students with dyslexia and specific reading and writing difficulties and significant underachievement.
- Provide an indigenous evidence-based program that can be used by schools and teachers in supporting the learning of secondary students with severe dyslexia and specific reading and writing difficulties and significant underachievement.
- Offer a core prototype which could be extended and refined to tailor for the specific needs of students with various learning difficulties, to promote their learning, and to prevent educational failure.

Conceptual framework

“Developmental dyslexia is defined as a disorder manifested by difficulties in learning to read and spell, despite normal intelligence and in the absence of sensory impairment, brain damage or environmental deprivation” (Chung, Ho, Chan, Tsang & Lee, 2010, pp.2-3). These difficulties often result in academic problems and in some cases, emotional and behavior problems.

Earlier studies (e.g. Ho, Law & Ng, 2000) supported the phonological deficit hypothesis and Chinese dyslexic children were found to be behind their age peers in phonological skills. Later studies supported the multi-deficit hypothesis where dyslexics are postulated to have deficits in more than one area. In a study on primary school children, Ho,

Chan, Tsang and Lee (2002) found that dyslexic children performed worse than their age peers on a number of cognitive tasks, with rapid naming deficit as the most prominent type. In another study on adolescents with dyslexia and specific reading and writing difficulties in Hong Kong (Mean age: 13 years), it was found that they were behind their age peers in literacy as well as cognitive skills including rapid automatized naming, verbal short-term memory, visual orthographic knowledge, morphological and phonological awareness (Chung et al., 2010). Chung and Ho (2010) also found that adolescents with dyslexia and specific reading and writing difficulties were behind their age peers in English literacy. Their English learning is affected by their deficits in linguistic coding and general processing problems in Chinese.

For diagnosis of children with dyslexia and specific reading and writing difficulties, the Hong Kong Test of Specific Learning Difficulties in Reading and Writing for Primary School Students (2nd ed.) (Ho, Chan, Tsang & Lee, 2007) and the Hong Kong Test of Specific Learning Difficulties in Reading and Writing for Junior Secondary School Students (Chung, Ho, Chan, Tsang & Lee, 2007) are the most commonly used tool. A child is classified as dyslexic if the child is of normal intelligence but below average in literacy domain composite scores and at least one cognitive domain (naming speed, phonological awareness, phonological memory and orthographic knowledge) composite scores (Chan, Ho, Tsang, Lee & Chung, 2007). Two teacher checklists have also been developed for screening, namely, The Hong Kong Behaviour Checklist of Specific Learning Difficulties in Reading and Writing for Primary School Students (2nd ed.) (Ho, Chan, Chung, Tsang & Lee, 2009) and The Hong Kong Behaviour Checklist of Specific Learning Difficulties in Reading and Writing for Junior Secondary School Students (Ho, Lo, Chan, Chung, Tsang & Lee, 2009).

In terms of intervention, in English speaking countries, reading programs that aim to promote phonological skills in the context of reading has been found to be effective. These programs are taught by trained personnel but recent evidence shows that this can be adapted for delivery by teaching assistants in small groups (Hatcher et al., 2006). Innovative programs have been developed and applied where schools created additional structures within the school to cater for the needs of students with learning differences (Green & Leaventon, 2005). However, Snowling and Hulme (2008) point out that there are few randomized controlled trials (RCT) evaluating the effectiveness of interventions and urge that RCT should be the gold standard in terms of methodology for informing policy and practice. In Hong Kong, a number of teaching packages for primary and junior secondary school students have been developed by the Education Bureau, Hong Kong Specific Learning Difficulties Research Team, The Chinese University of Hong Kong Institute of Educational Research and The Society of Boys' Centres, though there is limited published data on the effectiveness of these packages.

Needs Assessment

In English-speaking countries, the prevalence rate of reading difficulties is estimated to be around 4 to 8% (Snowling & Hulme, 2008). In Hong Kong, the prevalence of specific reading and writing difficulties is estimated to be around 9.7% to 12.6% based on a sample of children aged 6 to 10.5 years old (Chan, Ho, Tsang, Lee & Chung, 2007). There is no published data on the prevalence of dyslexia and specific reading and writing difficulties among secondary school students in Hong Kong, or the difficulties that they face in their academic work. In a study on the needs of primary school children with learning difficulties (Leung, Lau, Chan, Lau & Chui, 2010), parents reported that their children faced much difficulties and frustrations with school work. With a history of failure and frustration in primary school, it is not unreasonable to expect that junior secondary students with dyslexia and specific reading and writing difficulties will be facing severe challenges as the academic demands are higher and they are likely to lag further behind. This might lead to further behaviour or emotional problems while they are also facing the changes associated with adolescence. Support for this group of students is important to ensure that they can learn effectively and achieve their potential.

In Hong Kong, a whole school approach to support students with special education needs has been adopted since 2000

(Tsang & Leung, 2006). To support students with learning difficulties, a three-tier intervention model is in place. Tier one refers to quality teaching and support for students with mild or transient learning difficulties. Tier two refers to additional support for students identified to have persistent learning difficulties. Tier three refers to intensive support for students with severe learning difficulties (Education Bureau, 2009).

As mentioned above, though various teaching and learning packages have been developed for students with dyslexia and specific reading and writing difficulties, there is no clear documentation on how these packages can be most effectively used within the whole school approach, while catering for full curriculum demands, examinations and learning outcome. They may be incorporated into mainstream curriculum and used in mainstream classrooms or used as remedial activities for after-school tuition classes. In the former case, there may not be enough time and opportunity for junior secondary students with dyslexia and specific reading and writing difficulties to fully grasp and master the techniques while attending to the course content, as the teacher has to cater for the learning needs of other students and the regular curriculum. In the latter case, the techniques and skills taught may be quite segregated from the mainstream curriculum and there is also a time constraint for these after-school tuition classes. Adolescents might also resent such after-school arrangements as this limits their time and opportunity to participate in other extra-curricular activities, which are important for their holistic development. A possible alternative is to provide small group structured programs within a split group setting where the reading and writing techniques and skills can be fully integrated with the mainstream curriculum. Within a small group setting, students with dyslexia and specific reading and writing difficulties can have more support and time to master these techniques and the mainstream curriculum at their own pace. This study aims to develop a small group structured programs in English and Chinese for junior secondary school students with dyslexia and specific reading and writing difficulties within a split group setting, and to evaluate its effectiveness.

The proposed structured program places students with significant dyslexia and specific reading and writing difficulties and underachievement together in one of the split groups, in English and/or Chinese language subjects respectively. These students will be taught by teachers both from their own schools as well as by research project special language support teachers, with approach and materials to be developed by the research group, in coordination with the school's curriculum. The teaching approach will provide remediation for reading and writing strategies and abilities, and input for the school's normal curriculum for that grade. Students from this split class are expected to take formative and terminal assessments along with other students from their grade. Methods will take reference from currently available teaching and learning packages as mentioned above, as well as newly developed and evidence based measures by this project to intervene on reading and writing skills. Students are expected to gradually strengthen reading and writing skills, while keeping up with school curriculum, catching up on achievement levels, and restoring lost motivation and confidence in learning.

Pilot work completed by the project team

The project team has already started a pilot scheme of the project with two participating schools. Pathways staff workers have been employed to develop the program and deliver the program in two participating secondary schools. Teaching methods, specialized for students with dyslexia and specific reading and writing difficulties, are being developed by the research team in consultation with local and international programs, to be used for split class students in English and Chinese in pilot schools. Both bottom up and context driven reading and writing skills are strengthened, while keeping in view the requirements of the semester's curriculum for individual schools and classes. Teachers are being closely consulted in the pilot, with both the aims of seeking their input as well as coaching them on the specialized teaching methods.

Methods and outcomes are being documented for adapted application in this proposed research. Two schools have participated in this pilot phase and the initial feedback is positive. The schools find this compatible with the school timetabling and administrative arrangements. The new program to be developed will build on these experiences. With their foundation work and experience, it is expected that the project can be launched in full strength efficiently and effectively.

Innovation

This is an innovative program making use of the split class model to deliver a structured program which is integrated with the mainstream curriculum. The current inclusive educational approach in Hong Kong aims to allow all students with special needs to be accommodated and to achieve their personal best potentials. Whilst students with dyslexia and specific reading and writing difficulties have historically been in mainstream schools, programs that allow the optimum development of those with severe difficulties in secondary forms have yet to be tested, resulting in serious academic failure, learning demotivation and loss of personal potential for many. This project aims to develop and evaluate a program to bridge the gap in addition to reading and writing remediation.

This project is also innovative in that it integrates the input and expertise from specialist teachers, school teachers and student teachers from the Hong Kong Institute of Education, and specialists from educational and developmental psychology. This will not only guarantee expert input, but also ensure that the project will be sustainable, as both in-service teachers and student teachers can benefit and they can each help to deliver the program in their current and future work settings.

The program to be delivered is innovative in that it will specifically cater for students who are demonstrating significant gaps between personal potential and achievement, allowing the opportunity to catch up both with reading and writing skills whilst bridging the gap in educational content. It will also allow coaching of incumbent teachers on the mode and content of such a program, as well as allow pre-service students teachers to be exposed to such practices, thereby accelerating the pace of teacher readiness for these students.

Extent of teachers' and principal's involvement in the project

Principal – the principal plays a key role in the project as the principal has to mobilize the school team at a systems level. Students identified by the school will be referred before the commencement of school to the project team, which will ascertain their areas of deficits, underachievement and learning needs. The principal will oversee and monitor the project, together with the project team. The principal will support accommodation in timetabling and allocation of teacher duties to make the project viable.

Teachers – In this structured program within split-class model, the involvement of teachers is indispensable. The teachers will have to work closely with the specialist teachers in charge of the structured program to ensure that the participating students are learning the same curriculum as the mainstream students. It is also expected that there will be team teaching, so the teachers will become familiarized with the structured program. It is anticipated that school teachers will be able to take up the structured program in the long-run.

Specifically, in the beginning of the program, training will be offered to teachers with SEN responsibilities in the school. These teachers will be invited to participate in the structured program as observers in the first two months, and then they will be invited to start co-teaching in the third month. In the second term, they will be invited to co-develop the teaching materials and assessment tasks with the specialist teachers in charge of the structured program, in addition to co-teaching with them. It is expected that they can be fully competent and independent in teaching the structured program at the end of the project.

Applicants' capability

Research experience and publication record of the project team: The PL has been active in research and published over 40 refereed journal articles/book chapters on child development, program evaluation, and special needs education. She has been successful in obtaining a variety of external and internal research grants in Hong Kong and Australia. CPL1 has published extensively on dyslexia in the Hong Kong context. CPL1 has led research at the Department of Health to develop locally validated and normed tools for assessment of various aspects of child development. She is

also member of a number of longitudinal studies on developmental disabilities. She supports over 30 ongoing studies by staff within her Service, and participates in cross sector studies covering education, social and parent work domains. CPL2 is working at HKIEd, with the focus in training teachers for special needs. He has presented over 60 papers totally in local and international conferences held in different regions. The number of his publications, in form of chapters, articles, reports, texts, books and conference proceedings, reaches 85 in total. They are all with a wide range of topics on special needs, i.e. specific learning disabilities, giftedness, assistive technology in special needs, inclusion, diversity, autism, emotional and behavioural problems and sensory impairment. He is currently in-charge-of two research projects commissioned by Equal Opportunity Commission and Macau SAR. The project outcome will be significant in formulating policy and resource allocation in special needs.

Experience in program development and evaluation of the project team: The PL has extensive experience in program development and evaluation, including parent education programs and programs for dyslexic children in Hong Kong.

Clinical experience and tertiary teaching experience of the project team: The PL is an educational psychologist with extensive clinical experience in working with children and teaching in tertiary institutions. She is the Program Leader of the Master of Educational and Child Psychology in The Hong Kong Polytechnic University and Chairperson of Division of Educational Psychology, The Hong Kong Psychological Society. CPL1 is a clinician with extensive experience in dyslexia. CPL1 specializes in developmental paediatrics, provides clinical consultation to children with complex developmental problems and their families, and runs a clinical Service for these clients with over 60,000 annual appointments. She teaches medical students, postgraduate doctors, as well as postgraduate students at various tertiary institutions and departments on related subjects. CPL2 is the Director of the Centre for Special Needs and Studies in Inclusive Education. He took the leadership, in terms of academic and management aspects, for the course implementation for the EDB commissioned programs in wide range of special needs in 2007-2010.

Consultation experience of the project team: The PL has served as consultants for various research projects by government departments and non-governmental organizations, including Education Bureau and Department of Health, Tung Wah Group of Hospitals, Salvation Army and SAHK. CPL1 serves as advisor and consultant on various organizations on special needs education including Advisory Committee on Special Needs Teacher Education, Hong Kong Institution of Education, Hong Kong Association for Specific Learning Disabilities and The Spastics Association of Hong Kong. She is also the Vice President of The Hong Kong Society of Child Neurology and Developmental Paediatrics. CPL2 is a well known educator in special needs in the field. He offered a wide range of consultancy to schools, regions and government for special needs development.

Targets and expected number of beneficiaries: The targets are junior secondary school students with dyslexia and specific reading and writing difficulties. Initially, during the development and evaluation period, the direct beneficiaries are at least 150 students with dyslexia in five secondary schools. In addition, the teachers in these five secondary schools (about 60 teachers per school) will be also benefit in terms of strategies in enhancing the learning of students with dyslexia and specific reading and writing difficulties. Furthermore, teacher training will also be offered to the three control schools and it is expected that 180 teachers (60 teachers per school) and 90 students will also benefit. The program is potentially beneficial to other secondary school students with dyslexia and specific reading and writing difficulties and it is estimated that more than 20000 students (based on 10% prevalence rate for 238,026 S1 to S3 students in 2009/2010) and their teachers could benefit.

Implementation plan with time-line

Content and format of the program: The proposed details of the program are as follows:

- **Target clients** – junior secondary school students with dyslexia and specific reading and writing difficulties (confirmed cases with psychological report).

- *Program delivery* – during Chinese and English classes, participating students with dyslexia and specific reading and writing difficulties will attend a structured program within a split class mode taught by specialist teachers and subject special teachers from Pathways, to be assisted by student teachers from The Hong Kong Institute of Education. In the first two months of the program, school teachers will participate as observers and in the third month, the school teachers will co-teach with the specialist teachers/subject special teachers. In the second term, the school teachers will participate in the development of teaching materials and assessment tasks, in addition to co-teaching, supported by student teachers.
- *Program content and materials:* The program content will be developed by specialist teachers, making use of packages developed by Education Bureau (跨越障礙), Read & Write Project (勇寫無懼) and 讀寫易(何萬貫, 2010), and they will be integrated with the mainstream curriculum being taught in mainstream classrooms. The details are as follows:

	Characteristics	Content
Content	1. Strategy-based	<p><u>Chinese:</u> Focus on related strategy-based language teaching, to enhance student ability in language learning.</p> <p><u>English:</u> Address the phonological deficit of students with dyslexia and specific reading and writing difficulties (e.g. decoding, encoding), and to introduce strategies conducive to language development (e.g. identifying main ideas and supporting details, use of context clues).</p>
	2. Genre-based	<p><u>Chinese:</u> To use genre as the basic unit for teaching, with different learning components for different genres. The criteria for choice of genre are common usage and practicability, so students can apply their learning in their daily lives.</p> <p><u>English:</u> Introduce the text features and language characteristics of common text types (e.g. information texts, exchanges, stories, poems), and writing types (e.g. expository, narrative, descriptive, persuasive.) The students will be explicitly guided through reading of different genres to tie in with skills and application in written expression.</p>
	3. Learner-centered	<p><u>Chinese:</u> The design of the curriculum is based on the psychology of learning, i.e.</p> <ul style="list-style-type: none"> • top-down approach for teaching of concepts • bottom-up approach for teaching of language • micro uniting for concepts • constructive design • high order thinking skills • high & low road knowledge transfer • spiral curriculum design • authentic teaching content • clear & explicit instruction <p><u>English:</u> Explicitly provide an integrated language skills training to combine a bottom-up approach in reaching a language threshold, and a top-down approach in appreciating language usage.</p>
	4. Diagnostic Teaching	<p><u>Chinese:</u> Through observation of student performance on class exercises and worksheets, the teacher will make adjustment based on knowledge of student ability to grasp the various components. The use of mistakes as the target of diagnostic learning will be emphasized through self-regulated learning and response action</p>

		<p>strategy.</p> <p><u>English:</u> Identify student's needs and bridge the learning gap. A set of criterion-based English language assessment tools are used to evaluate English language proficiency in the following aspects:</p> <ul style="list-style-type: none"> ✓ oral speaking ✓ phonemic awareness (initial sound recognition, blending, segmentation) ✓ sight word recognition ✓ oral reading level ✓ silent reading level ✓ spelling ✓ creative writing
Teaching Strategy	5. Self-regulated Learning	<p><u>Chinese:</u> Mastering strategies such as goal setting through feedback.</p> <p><u>English:</u> Encourage independent learning goals set by the student to study goal orientation and monitor progress in a structured way with a manageable pace.</p>
	6. Mega-cognition & Enactive Learning (thinking about your thinking, and knowing)	<p><u>Chinese:</u> To facilitate the mastery of learning content to experience the process of mistakes and corrections.</p> <p><u>English:</u> Develop noticing skill and mega-cognitive awareness for error analysis and self-correction.</p>
	7. Scaffolding · Zone of Proximal Development & Thinking Aloud	<p><u>Chinese:</u> Using various media and thinking aloud demonstration.</p> <p><u>English:</u> Establish a systematic language teaching and evaluation platform to match with student's proficiency and reflect student's potential respectively.</p>
	8. Multiple input and output to accommodate for different learning needs	<p>For both Chinese and English, the teaching strategies will employ multiple input such as audio or visual materials to cater for students' diverse learning needs. Students will be provided with different modes of output (e.g. oral responses) to demonstrate their learning. Assessment can take on different forms such as multiple choice questions, oral answers and the content consists of core tasks and advanced tasks for students with different abilities.</p>

Expected outcome: it is expected that the structured program can help to narrow the curriculum gap for students with dyslexia and specific reading and writing difficulties. This will be measured in terms of improvement in academic performance, reading and writing. For success criteria, it is expected that the intervention group will report more improvement in these areas than the control group at post-intervention, as measured by their post-intervention scores on academic achievement, reading and writing. Furthermore, it is also expected that the intervention group will report better scores on self-regulated learning and perceived quality of school life at post-intervention, in comparison with the control group. Evaluation forms will also be collected from schools and teachers to examine their perceived effectiveness, competence and confidence in supporting students with dyslexia. This will be supplemented and complemented by quality data from schools and teachers through focus group discussions/individual interviews.

Timeline: The project will be implemented in four phrases.

- Phase one (3 months) – **program development** – The program materials will be finalized by subject development cum special language support teachers in the research team with training and experience in teaching students with dyslexia and specific reading and writing difficulties. **Formative evaluation** will be conducted to improve the quality of the program materials.
- Phase two (12 months) – **Pilot evaluation** will be conducted with two schools. **Process evaluation** will be conducted through focus group discussions with program participants and service providers.

- Phase three (12 months) – **Outcome evaluation** will be conducted using quasi-experimental design, involving six schools. **Process evaluation** will be conducted through focus group discussions with program participants and service providers.
- Phase four (3 months) – **report writing and dissemination of results** – the program will be finalized and the report will be completed. The whole package, including manuals and activities will be finalized for production. The results will be disseminated in public seminars/press conferences and manuscripts will be prepared for submission to international journals for publication.

Collaborating Organizations:

1. Caritas St. Joseph Secondary School (明愛聖約瑟中學)
2. The Church Of Christ In China Kei To Secondary School (中華基督教會基道中學)

Expected Deliverables and Outcomes

Tangible deliveries	Attainment level
Production of an evidence-based program to promote learning of junior secondary students with dyslexia and specific reading and writing difficulties.	One program produced
Production of a manual for conducting the program, related worksheets and activities. Teaching materials for curriculum adaptation, reading and writing assessment and remediation materials will be produced.	500 sets to be distributed to secondary schools
Production of a manual on logistics for identifying target students and organizing split classes and time tables and related administrative matters.	
Tools for measuring progress and outcome in supported students	
Production of a report on the implementation and evaluation of the project	500 copies
Publication in international journals	At least one article
Dissemination and training seminars	At least one seminar each for Hong Kong, Kowloon and New Territories
Intangible outcomes	Indicators
Promoting student learning and supporting students to be more effective, confident and competent learners so they can bridge the curriculum gap	Pre- and post- program quantitative assessment of student academic achievement, literacy, quality of school life, self-regulated learning, using standardized tests and school results
Teachers and schools will be more effective, competent and confident in supporting and enhancing the learning of students with dyslexia and specific reading and writing difficulties.	Number of training sessions offered to school teachers
Teaching teams from participant schools experienced with the developed teaching program, and designing different forms of assessment tasks.	Number of teachers participating in the training sessions
Student teachers familiarized with supporting secondary students with dyslexia and significant reading and writing difficulties.	Number of teachers participating as observers in class and sessions attended
	Number of teachers working as co-teachers with specialist teachers and number of sessions co-taught

	Number of student teachers involved in the project Evaluation forms on perceived competence, confidence and effectiveness Focus group discussion and individual interviews
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Budget: 2,968,800.00

	Phase 1	Phase 2	Phase 3	Phase 4	Total
One half-time Project officer (Staff cost)	31,410.00	125,650.00	125,650.00	31,410.00	314,120.00
One Half-time Chinese subject development cum special language support teachers (Staff cost)	77,220.00	308,880.00	308,880.00	77,220.00	772,200.00
One Half-time English subject development cum special language support teachers (Staff cost)	77,220.00	308,880.00	308,880.00	77,220.00	772,200.00
One Half-time Chinese subject special language support teacher (Staff cost)		152,810.00			152,810.00
One Half-time English subject special language support teacher (Staff cost)		152,810.00			152,810.00
Two Half-time Chinese subject special language support teachers (Staff cost)			305,610.00		305,610.00
Two Half-time English subject special language support teachers (Staff cost)			305,610.00		305,610.00
Ten student teachers (Services)		48,000.00	72,000.00		120,000.00
Student learning materials (General expense)		9,600.00	14,400.00		24,000.00
Teaching reference and materials (General expense)		6,000.00	9,000.00		15,000.00
Project manual (1000 copies) (General expense)				10,000.00	10,000.00
Travelling expenses (General expense)		4,800.00	9,600.00		14,400.00
Miscellaneous expenses (General expense)	1,000.00	4,000.00	4,000.00	1,040.00	10,040.00
	186,850.00	1,121,430.00	1,463,630.00	196,890.00	2,968,800.00

Justification

- One half-time Project officer – one half-time project officer for 30 months. This person should be a degree holder with working experience and be responsible for staff and schools recruitment and coordination, data collection and entry, assistance with development and production of teaching materials, and manual production and dissemination (full-time monthly salary HK\$19,945)

- Two part-time subject development cum special language support teachers – one part-time English subject development officer and one part-time Chinese subject development officer with master degree and solid relevance teaching experience to develop and teach students with dyslexia and specific reading and writing difficulties user-friendly Chinese/English subject curriculum, coordinate subject curriculum subject matters with schools and teachers, and assist in writing project manual and project dissemination (monthly salary HK\$49,480 plus MPF)
- Part-time special language support teachers - one part-time special Chinese language support teacher and one part-time special English language support teacher for 24 months (phases 2 and 3), and one additional part-time special Chinese language support teacher and one additional part-time special English language support teacher for 12 months (phase 3) to conduct the teaching. They should be degree holders with teaching experience (full-time monthly salary HK\$24,255 plus MPF)
- Four student teachers for 24 months at HK\$1000 per month and six student teachers for 12 months at HK\$1000 per month to assist in teaching and curriculum development (two student teachers per school)
- Printing of teaching reference and material
- Printing of project manual (1000 copies)
- Student learning material (HK\$400 per month per school)
- Travelling expenses
- Miscellaneous

Asset Usage Plan

Category (in alphabetical order)	Item Description /	No. of Units	Total Cost	Proposed Plan for Deployment (Note)
audio and video equipment				
book & VCD				
computer hardware				
computer software		NIL		
musical instrument				
office equipment				
office furniture				
sports equipment				
Others				

Note: for use by school / organization / in other projects (please provide details of the department / centre to which the asset will be deployed and the planned usage of the asset in activities upon project completion).

My organization 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 1/7/2011 - 31/12/2011	31/1/2012	Interim Financial Report 1/7/2011 - 31/12/2011	31/1/2012
Progress Report 1/1/2012 - 30/6/2012	31/7/2012	Interim Financial Report 1/1/2012 - 30/6/2012	31/7/2012
Progress Report 1/7/2012 - 31/12/2012	31/1/2013	Interim Financial Report 1/7/2012 - 31/12/2012	31/1/2013
Progress Report 1/1/2013 - 30/6/2013	31/7/2013	Interim Financial Report 1/1/2013 - 30/6/2013	31/7/2013
Final Report 1/7/2013 - 31/12/2013	31/3/2014	Final Financial Report 1/7/2013 - 31/12/2013	31/3/2014

Evaluation: In line with the principle of evidence-based policy, evaluation is a major feature of this project.

Phase one – program development – The program will be developed by the subject development cum special language support teachers in the research team. The evaluation strategies include:

- **Formative evaluation** – while the materials are being developed, they will be trialled out by volunteers and their feedback will be obtained to make the materials and delivery process more suitable to the needs of the users
- **Expert review** – the program will be reviewed by an expert panel consisting of experts in dyslexia and specific reading and writing difficulties, educational psychologists and teachers.

Phase two – pilot evaluation – the program will be piloted with two secondary schools. A total of 60 students with dyslexia and specific reading and writing difficulties from two secondary schools will be recruited, with 10 students with dyslexia and specific reading and writing difficulties in each form in each school. The students have been diagnosed as dyslexic using standardized tests including the Hong Kong Wechsler Intelligence Scale for Children and the Hong Kong Test of Specific Learning Difficulties.

Phase three –outcome evaluation – the effectiveness of the program will be compared by comparing the intervention

group with a comparison group (usual practice). A total of 180 students with dyslexia and specific reading and writing difficulties from 6 secondary schools from various districts will be recruited. The students are students who have been diagnosed as dyslexic using standardized tests including the Hong Kong Wechsler Intelligence Scale for Children and the Hong Kong Test of Specific Learning Difficulties. Three schools who are willing to implement the structured program will be the intervention group. Three other schools matched in banding and demographic profile of students and number of students with dyslexia and specific reading and writing difficulties will be the comparison group where they will continue their usual practice for supporting students with dyslexia and specific reading and writing difficulties (tier two support as defined by EDB). In all participating schools, it is expected that 10 students with dyslexia and specific reading and writing difficulties from each form will be included.

Sample size - For a medium effect size (.50), the required sample size ($\alpha = .05$, power = .80,) is 64 per group (Cohen, 1992). As the group allocation is at a school level, the sample size is increased by about 50% to allow for design effect (Kerry & Bland, 1998).

Assessment/tests used in evaluation

The Assessment includes pre and post intervention tests of academic achievement, literacy skills, quality of school life and independent learning capacity. The primary outcomes are academic achievement and literacy skills. In phase two, dependent t test will be used to compare pre and post intervention results on various measures (see below). In phase three, data analysis will employ a two-stage process where in stage one, a summary measure will be obtained for each group (cluster) and in the second stage, the group (cluster)-specific measure will be compared using independent t test. (Hayes & Moulton, 2009). Adjustment for covariates (e.g. pre-intervention scores) will be made where necessary, following the techniques recommended by Hayes and Moulton (2009). Hayes and Moulton (2009) recommend that individual level regression method may not be suitable for cases with less than 15 clusters in one arm, because of possible problems with inflated type I error. Cluster level analysis would be used. The pre-intervention data would be used as covariates and a two-stage analysis would be employed. In the first stage, the post-intervention scores would be regressed on the relevant pre-intervention scores. Residuals for each cluster would be computed. In the second stage, the cluster level residuals would be used in the analysis, using independent t test.

During phases two and three (pilot evaluation and outcome evaluation-), the students will be assessed on the following measures before (baseline) and after program completion, unless otherwise specified.

- Academic achievement - The academic achievement assessment tasks will be designed by the specialist teachers and school teachers, with core tasks and advanced tasks, to cater for students with different degrees of difficulties. The participating schools will provide the Hong Kong Attainment test results (pre-secondary 1) for participating secondary 1 students as a baseline measure. The most updated available version of Hong Kong Attainment Test will be used for post-intervention measure for all participants, as well as pre-intervention measure for secondary 2 and secondary 3 participants. In addition, end of school year results will be used as post-intervention measure. The results will be transformed into standardized scores so comparison can be made across schools. For secondary 2 and 3 students, the end of school year results of the previous year will be used as pre-intervention scores and the end of school year results of the current year will be used as post-intervention measures. Standardized scores will be used so comparison can be made. Participating schools will be requested to supply the raw scores of students' end of school year results for calculation of standardized scores. The names of non-participating students will not be needed.
- Checklist based on Pathways Diagnostic Interview – a checklist will be developed out of the Pathways Diagnostic Interview, where class teachers will be invited to rate students' language skills in Chinese and English in areas such as speaking and listening, phonemic skills, orthographic knowledge, sight word recognition, oral reading,

silent reading, dictation and writing. The assessment content design is consistent with the Wechsler Individual Achievement Test which covers areas including Oral Reading, Early Reading Skills, Enriched Listening Comprehension, Oral Expression, Written Expression and Reading Comprehension (Pearson Education, 2010). References will also be made from other standardized tests of reading comprehension (silent and oral) and written expression. Rasch analysis will be conducted to examine the psychometric properties of the checklist.

- 香港中學生中文讀寫能力測驗(何萬貫, 2008) – this will be the measurement for literacy skills. This test can be administered and scored by Chinese teachers and consist of 9 parts (組詞、改錯、斷句、抄寫、默寫、朗讀、寫作、閱讀理解、閱讀速度). There are norms for Form 1, Form 3 and Form 5. (may use raw scores for F.2)
- Quality of school life scale (Ainley, Foreman & Sheret, 1991) – This scale consists of 7 sub-scales, namely achievement (6 items), experience (5 items), general satisfaction (6 items), negative affect (7 items), opportunity (7 items), social integration (7 items) and teacher-student relationship (7 items). Students rate their degree of agreement with the statements on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). The reliability estimates (Cronbach's Alpha) of all sub-scales are above .80 in the APASO study. In the APASO study, all scales have very low school level and class level intra-class correlations and psychometrically these items can be used for individual assessment. The Chinese version has been validated by Pang (1999). Permission to use the scale has been obtained from Professor Ainley.
- Self-regulated learning scale (Mok, Cheong, Moore & Kennedy, 2006) – Permission to use the scale has been obtained from the author. The scale consists of 13 sub-scales (76 items), namely academic motivation (5 items), initiation (5 items), self monitoring (10 items), self-regulation (5 items), academic self-confidence (5 items), costs of help seeking (5 items), goal setting (6 items), inquisitive mind (5 items), information processing (10 items), strategic help seeking (5 items), management of learning environment (5 items), planning (5 items) and value of schooling (5 items). Students rate their degree of agreement with the statements on a 4-point scale (1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree). The psychometric properties of the scale have been established by Mok et al. (2006).
- Demographic information

For **process evaluation**, the views of participating students and teachers in relation to the program materials, activities and delivery format, will be collected through focus groups. Teachers' and schools' perceived competence, effectiveness and confidence in supporting students with dyslexia will be collected through focus group discussions or individual interviews. Focus group discussion/individual interview guides will be used for the discussions.

Upon completion of the project, the project materials will be made available to the control schools and training will be offered to these schools by the special language support teachers in the research team.

Ensuring the objectivity and standard of the evaluation – (i) the research design adopted is designed to achieve a high standard of internal validity; (ii) the research team are not directly involved in the assessment of the participants; (iii) the findings will be submitted to referred journals for blind peer review; and (iv) the administration of the participating secondary schools will be invited to comment on the progress of the study during the interim period and completion of the pilot and efficacy trial.

of The Hong Kong Institute of Education will be invited to be the Quality Assurance Advisor, and (also of The Hong Kong Institute of Education) will be invited to be the Chinese Subject Consultant. will be invited to be the potential English Subject Consultant.

Sustainability of the Outcomes of the Project

Students: As the students are taught learning skills which are transferable and generalizable, they should continue to use these skills in their learning. As they are better equipped for learning and schooling, it is expected that this will help to bring continued success in their further education.

Teachers and other professionals: As the teachers in the intervention schools have participated in the teaching and

developing of teaching materials, they will be fully competent in implementing the program. These teachers and the intervention schools could also be invited to share their best practices with other schools through sharing workshops and seminars. They could form partner schools with other interested schools to share experiences and mentor the interested schools. With the publication of the detailed manual together with related learning materials, the training, and the use of team teaching, it is expected that teachers and other professionals could use this program with other students with dyslexia and specific reading and writing difficulties. Furthermore, the positive experience of this structured intervention program will encourage more research and development in this area, which will benefit students, teachers and schools. In addition, as student teachers are involved in the program, it is expected that they would also be equipped to be able to deliver the program upon their graduation.

Dissemination/Promotion: Press conference/public seminars will be conducted to share the findings with professionals, schools and parents. Dissemination/training seminars will be conducted for the three districts, Hong Kong, Kowloon and New Territories. The findings will also be presented in international/regional conferences. Manuscript for submission to international journals will be prepared.

Ideally, follow-up studies should be conducted to investigate the long-term effect of the program but this would require extra resources and manpower. This study is considered an essential first step in establishing the efficacy of the structured intervention project. A large scale implementation of this program could be launched to further evaluate the effectiveness of the program and to benefit more students and schools. With additional funding, Pathways could continue to offer in-service support and training for schools and teachers in supporting students with dyslexia.

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