For discussion
on 7 June 2024

Legislative Council Panel on Education

Implementation of Information Technology in Education in Primary and Secondary Schools

Purpose

This paper aims to brief Members on the implementation, support measures and way forward of the information technology (IT) in education (ITE) in primary and secondary schools.

Background

2. In line with the global trend of harnessing IT to enhance learning and teaching effectiveness, the Government has launched four strategies on ITE since the 1998/99 school year to put forward proposals on the way forward and support measures of ITE. The First Strategy (launched in the 1998/99 school year) sought to provide schools with IT infrastructure and enhance the IT competence of teachers; the Second Strategy (launched in the 2003/04 school year) aimed to enhance the capacities of students and teachers to use IT for learning and teaching with the provision of professional development programmes and e-learning resources; the Third Strategy (launched in the 2007/08 school year) focused on the human factor necessary for integrating the appropriate use of IT into learning and teaching, thereby empowering schools to formulate school-based ITE development plans; and the Fourth Strategy (launched in the 2015/16 school year) focused on the establishment of Wi-Fi campuses and use of mobile computing devices, providing high-quality e-learning resources and enhancing teachers' professional capabilities. The Government has invested over $17 billion for promoting ITE since the 1998/99 school year.

3. The support measures of the Education Bureau (EDB) in promoting ITE in recent years and the implementation of ITE in primary and secondary schools are reported below:

Support Measures for ITE

4. The various strategies formulated by the EDB to promote ITE aim to unleash the learning power of students to learn and to excel by making good use of IT to enhance interactive learning and teaching experiences. In order to use IT to enhance learning and teaching effectiveness, we have been adopting diversified strategies, which include improving the hardware in schools, providing resources and teacher training, etc., to enable schools to devise school-based plans for practising e-learning according to their school contexts and development needs. The related support measures are elaborated in the ensuing paragraphs:

Enhancing schools' IT infrastructure

5. One of the key initiatives in the Fourth Strategy on ITE launched by EDB in the 2015/16 school year was to establish Wi-Fi campuses in all public sector schools[1] over the territory. The purpose is to facilitate students' e-learning using mobile computer devices in class. The work to install the necessary facilities, including Wi-Fi, software and hardware for teaching, and online learning resources, in all public sector schools in Hong Kong for the promotion of e-learning was completed on schedule in 2020.

6. Besides, to support e-teaching, starting from the 2004/05 school year, the EDB has been providing all public sector schools with the Composite Information Technology Grant (CITG). Schools may deploy the grant flexibly to subscribe Wi-Fi services, purchase and enhance different software and hardware for online teaching and strengthen IT staffing support. In the 2023/24 school year, the rate of CITG for each school ranged from $271,286 to $885,113, depending on the school type and the number of classes. In addition, starting from the 2017/18 school year, the EDB has been providing all public sector schools with the recurrent Information Technology Staffing Support Grant (ITSSG) each year to strengthen IT staffing support. In the 2023/24 school year, the funding amount of ITSSG for each school was $333,812.

7. During the COVID-19 epidemic, schools supported students in learning at home and maintained their motivation of learning by using various electronic tools and the blended mode of teaching and learning, so that students were able to learn during the class suspension. Schools also took the opportunity to expedite the development of e-teaching and enhance the effectiveness of e-learning. Through a three-year assistance programme

[1] It includes government, aided (including special schools), caput and Direct Subsidy Scheme schools.

launched from the 2018/19 to 2020/21 school years under the Community Care Fund, the EDB subsidised about 176 000 needy primary and secondary students to purchase mobile computer devices, to support their e-learning at home effectively amidst the epidemic. Subsequently, to further support schools in implementing the blended mode of teaching and learning, the Quality Education Fund (QEF) has earmarked $1.5 billion to launch a three-year funding programme starting from the 2021/22 school year to subsidise schools to purchase mobile computer devices for loan to needy students. Schools may also provide portable Wi-Fi routers and mobile data cards to students who do not have access to appropriate Internet services due to the constraints in their living environment. The school sector has responded actively to the programme. Since its launch, about 810 schools have participated in the programme, benefiting over 66 000 students so far.

8. Apart from the above initiatives to support needy primary and secondary school students in e-learning, the QEF has also earmarked $500 million for implementing "e-Learning Ancillary Facilities Programme" to facilitate in-depth collaboration among the school sector, tertiary institutions, educational bodies, and business sector to jointly develop and provide quality e-learning ancillary facilities for use by schools. A total of 22 projects, covering areas such as learning and teaching tools, sharing of resources and assessment platforms, have commenced at the beginning of the 2023/24 school year (a list of projects is at Annex 1). These projects deploy innovative technologies, such as big data and artificial intelligence (AI), to enhance learning and teaching effectiveness in a wide array of subjects, as well as develop adaptive learning platforms with the use of data analysis to provide instant feedback to cater for learners' diversity and nurture students' self-directed learning capability. Beneficiaries of the above programme include secondary, primary and kindergarten students, as well as students with special educational needs.

Strengthening teachers' training and relevant support

9. While enhancing the IT infrastructure of schools, we are also committed to providing relevant training and support for teachers. To enhance the professional leadership capabilities of school leaders in promoting e-learning, as well as teachers' e-learning repertoire and their ability to use various e-learning tools and resources, the EDB has organised more than 3 000 events of professional development programmes for teachers since the 2015/16 school year, so far attracting over 135 000 participants in total. A list of the relevant professional development programmes organised for teachers in the current school year (up to April 2024) is at Annex 2. Included in the list are also AI-related programmes which cover the

development of AI and planning of applying AI in teaching and learning as well as the application of AI tools in different subjects. We have held more than 60 sessions of relevant training since the 2021/22 school year with a total attendance of nearly 4 300.

10. Meanwhile, we set up the IT in Education Centre of Excellence (CoE) in the 2000/01 school year, which consists of schools with successful experience in ITE. Serving teachers from their schools provide training and on-site support services for other schools. Schools offering the services also open their school campuses for activities such as teaching demonstration and class observation for sharing the good practice with other schools. Currently, a total of 14 schools have joined to provide the above services. Since the launch of the Fourth Strategy on ITE in the 2015/16 school year and up to the present (as of April 2024), the CoE has delivered more than 1 900 times support services. The CoE has also built teachers' learning communities for scaling up good practices, consolidated new experiences, as well as enhanced teachers' repertoire and ability to use e-learning tools and resources. In addition, the CoE has introduced various kinds of resources and expertise to help schools trial run new e-learning related pedagogies and solutions. To assist the promotion of school-based ITE, the QEF has granted approval to approximately 1 000 related projects in the past five school years with a total funding of $400 million.

Enhancing the quality of e-learning resources

11. Apart from infrastructure and teacher training, e-learning resources are equally important in the promotion of e-learning. In recent years, there has been a significant enhancement of e-learning resources (including e-textbooks) in terms of quality, quantity and variety, providing schools with another option of quality learning and teaching resource in addition to printed textbooks. The E-textbook Market Development Scheme (EMADS) launched by the EDB in 2012 encouraged aspiring e-textbook developers to develop e-textbooks for various subjects in line with the local curricula for adoption by schools. The submission of e-textbooks for review has become a regular practice since 2016 upon the conclusion of the EMADS. Currently, the Recommended e-Textbook List contains 51 sets of e-textbooks, covering a wide range of subjects at the primary and secondary levels. Furthermore, the EDB continues to provide schools with free e-learning resources.

12. In addition, the Hong Kong Education City Limited (HKEdCity)[2] has been providing schools, teachers and students with a one-stop resource and services on e-learning, e-reading, e-assessment, etc., and actively promoting AI education. On e-learning resources, the HKEdCity provides schools with multimedia resources through the Educational MultiMedia website, and procures or assists in the procurement of quality e-learning resources both locally and from overseas via the e-Resources Acquisition Project (eREAP) for schools' use. The HKEdCity also organises a large-scale Learning and Teaching Expo every year to provide teachers with the opportunities to exchange on teaching and learning and to learn about the latest e-learning products and resources. In respect of e-reading resources, the HKEdCity helps promote extensive reading in schools by providing e-resources related to reading through the eRead Scheme. As for e-assessment resources, the Online Student Assessment System (STAR) launched by the HKEdCity supplies assessment tools and assignments on subjects including Chinese Language, English Language and Mathematics at the primary and junior secondary levels. On promoting AI education, apart from providing teachers and students with AI learning platforms, courses and teaching materials, the HKEdCity also organises the Coding Olympics to encourage students to use AI for data analysis. To enhance service quality, the HKEdCity conducts user surveys regularly as well as gauges users' satisfaction and collects frontline teachers' views through relevant teacher organisations. According to the information and feedback collected, users were generally satisfied with the services provided by the HKEdCity.

Promoting information literacy education

13. The EDB attaches great importance to the nurturing of students' information literacy (IL). In this regard, we have provided the "Information Literacy for Hong Kong Students" Learning Framework[3] to facilitate schools in nurturing students' ability and attitude to use information and communication technology effectively and ethically in learning and daily life. To strengthen the IL-related learning elements in primary and secondary

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[2] The HKEdCity is a wholly owned company of the Government. Its one-stop professional education portal (edcity.hk) combines information, resources, interactive communities and online services to facilitate the interactive exchange of teaching resources and information among schools and teachers, encourage students to make effective use of e-learning resources, and support parents in nurturing their children to thrive and learn for the promotion of whole person development and lifelong learning. The HKEdCity provides the education sector with diversified education information and resources, including the Resources Depository, e-bookshelf, AI learning platform, EDB Educational MultiMedia, as well as learning platforms and resources on teenagers' personal growth.

[3] The full text can be found at https://www.edb.gov.hk/en/ite/IL-learningframework.

curricula and to further enhance students' IL to meet the challenges brought about by the rapid development of the digital world, the EDB launched the updated "Information Literacy for Hong Kong Students" Learning Framework in 2024 with enhanced contents on Information Evaluation, Cyberbullying Prevention, Personal Data Privacy Protection and Internet Addiction Prevention. Additionally, a new literacy area titled "Recognise the ethical issues arising from the application of emerging and advanced information technologies" has been added, which encompasses issues related to laws and regulations, academic integrity and excessive dependence on technology arising from innovation and technology such as AI technology, so as to nurture students as ethical IT users and prepare them to tackle the challenges posed by new technologies. The EDB also provides relevant learning and teaching resources and professional development programmes for teachers, including courses on IL education (basic level) for new teachers and relevant advanced courses for teachers of different subjects. There are also development activities for teachers which explore in depth individual IL themes as well as relevant courses designed for teachers responsible for the planning of parent education. All these aim to provide comprehensive support for schools in promoting school-based IL education. Moreover, through regular seminars, assistance has been given to parents on ways of helping their children develop proper attitude towards using IT in daily life and learning. A telephone hotline has also been set up to provide individual support for parents, teachers and students in need. In addition, the QEF launched the Enhanced "My Pledge to Act" Funding Programme in 2021 which allowed schools to make use of the funding to implement measures to promote students' IL. The programme has granted approval to about 600 projects since its launch, involving a total funding of $67 million.

Collaborating with stakeholders

14. All along, the EDB has been forging close partnership with different community stakeholders and the IT sector for creating synergy to facilitate the accumulation of resources for teachers, students and parents as well as the provision of continuous professional support. The EDB has engaged tertiary institutions and the IT sector in the professional development of teachers, production of resources and organisation of territory-wide student activities. We have signed Memorandums of Understanding[4] (MOUs) with IT enterprises to form collaborative partnership in using IT to support learning

[4] Since 2004, the EDB and Microsoft Hong Kong Limited have signed a total of five MOUs, which have outlined comprehensive support for e-learning, including various training, resources and tools.

and teaching in primary and secondary schools in Hong Kong. We have also co-organised parent seminars, exhibitions and workshops on e-learning and e-safety with non-governmental organisations, HKEdCity, teacher associations and the Committee on Home-School Co-operation. Most of the participants found the seminars useful and the topics relevant to their needs.

Current Situation of the Implementation of ITE

15. The EDB has been collecting information from schools through different channels such as questionnaire surveys, focus group meetings, case studies and school visits to understand the implementation of ITE in schools and to review the effectiveness of various support measures. Feedback from schools on e-teaching on the whole was positive. Schools generally agree that e-teaching can help enhance students' learning effectiveness.

16. According to the Survey on Information Technology in Education (the Survey), from the 2018/19 school year onwards, all the responded schools expressed that they have been using e-learning resources in teaching, reflecting that e-teaching has become popular in local schools. At present, each school has over 250 mobile computer devices on average for learning and teaching purposes. Compared with the average of about 133 in the 2018/19 school year before the epidemic, the increase was as high as 88%. The provision has greatly facilitated students in using mobile computer devices for e-learning, allowing learning and teaching to go beyond the boundaries of traditional classrooms. On the other hand, schools have been actively participating in the professional training programmes and on-site support services provided by the EDB. According to the teachers' feedback collected, it is generally agreed that the related training and support services provided by EDB could keep pace with the times and cater for the actual needs of their schools, effectively empowering teachers to use IT to enhance learning and teaching effectiveness.

17. A great majority of the schools agreed that, with the implementation of e-learning, there have been positive changes in learning and teaching and the outcomes were encouraging. On students' learning, according to the Survey for the 2023/24 school year[5], more than 98% of the schools indicated that since the implementation of e-learning, students have been more motivated to learn through active knowledge construction and students' self-directed learning have been enhanced, while teacher-student and student-student interactions as well as collaborative learning among student peers have been strengthened. Besides, e-learning has helped students master

[5] The response rate was 90.1%.

abstract concepts and complicated issues. Students have also shown a higher level of IL, in particular, the ethical use of IT. In addition, more than 93% of the schools indicated that e-learning has been conducive to strengthening students' critical thinking skills, problem solving skills, computational thinking competency and creativity. Compared with the Survey for the 2018/19 school year, there was an average increase of 8% in each of the above aspects, which shows that e-learning is more conducive to students' all-round learning development than it was 5 years ago.

18. On teaching, the outcomes were equally significant. Around 99% of the schools considered that comparing with the pre-pandemic period, teachers have increased confidence in, and a better grasp on the essence of, using e-tools to enhance teaching effectiveness. Also, teachers' pedagogy has been transformed with the use of IT/e-learning. For instance, teachers would use apps to support students in unleashing their creativity and design different modes of teaching for engaging students in learning across time and space.

19. Regarding IL education, the Survey conducted for the 2023/24 school year shows that all schools have implemented IL education already, and IL elements have been incorporated into the learning and teaching of various subjects in around 98% of schools. The increase was significant compared with around 33% in the Survey for the 2018/19 school year. It reflects that schools have attached importance to IL education, and have promoted the ethical and effective use of IT among students in the teaching of different subjects. Furthermore, more than 99% of teachers agreed with the updated and newly added contents of the "Information Literacy for Hong Kong Students" Learning Framework. As understood from the focus group interviews, schools generally considered that the whole-school approach advocated by the EDB was effective in promoting IL education and that schools obtained positive results in cultivating students' IL.

20. The above survey findings echo the observations made during inspections and school visits. According to the inspections and school visits conducted in both the 2021/22 and 2022/23 school years, owing to the active promotion of e-learning in schools in general, teachers and students possessed a certain level of IT competence and literacy. Teachers were capable of using apps and e-learning resources to explain abstract concepts, facilitating students' understanding of the learning contents. They could also observe students' real-time performance with the help of e-learning tools so that teaching progress could be adjusted as necessary, and opportunities could be provided for students to understand their own performance, facilitating an extension of their learning. In recent years, schools have accumulated ample experience in the blended mode of teaching and learning as well as e-learning

pedagogy. Following the resumption of whole-day face-to-face classes, some teachers have also better utilised "learning time" to organise students' learning within and beyond the classroom in a more flexible manner. For instance, e-learning platforms or applications have been used to arrange learning and teaching activities to connect the pre- and post-class learning so as to continuously develop students' self-learning habits and abilities.

21. The information and feedback collected from schools through various channels on the whole indicate that the EDB's efforts in implementing ITE in various key aspects have been effective and the relevant support measures are generally recognised and welcomed by schools.

The Way Forward

22. Given the advantages mentioned above, we suggest the following for the future development direction of ITE:

Continue to support STEAM education and enhance students' IL

23. E-Learning and STEAM education go hand in hand. In view of this, the EDB will continue to integrate the strategies on ITE with STEAM education and further strengthen professional development programmes and on-site support to schools so as to promote the use of IT in enhancing the teaching effectiveness of STEAM education. Meanwhile, we will continue to provide support for schools on the e-learning of other subjects, and will strengthen teachers' training and develop relevant learning and teaching resources according to the updated "Information Literacy for Hong Kong Students" Learning Framework for further nurturing the IL of students.

Provide support for schools in the use of innovative education technologies

24. Echoing the national strategy of invigorating the country through science and education, the EDB will continue to actively provide teachers with professional development programmes, including AI-related ones which cover the development of AI and planning of applying AI in teaching and learning, as well as application of AI tools in different subjects. Regarding the "e-Learning Ancillary Facilities Programme" of the QEF mentioned in paragraph 8, all 22 projects involved the application of innovative technologies. Of which, 18 projects deployed AI technologies to enhance learning and teaching effectiveness in a wide array of subjects, including an AI system which helps teachers design and analyse teaching and learning, a language learning platform which uses chatbot technology, and an e-learning platform using AI to assess and analyse students' learning performance with

instant feedback. These projects help teachers enhance pedagogical design and increase students' learning effectiveness. The QEF has already invited the Hong Kong Productivity Council to provide professional advice and mentorship support to the grantees. The HKEdCity will also render support to the programme by uploading the deliverables of related projects onto its website. To facilitate the smooth completion of various projects and promote the deliverables, the EDB will maintain close contact with the grantees, monitor the progress of various projects through on-site inspection, scrutiny of the progress reports submitted by the grantees and attending the related sharing sessions and promotional activities, and give timely advice and support as appropriate. It is expected that the deliverables will be released for use by local schools progressively in the 2024/25 and 2025/26 school years, which will enhance the learning and teaching effectiveness of different subjects, thereby bringing benefits to the education sector at large.

25. In respect of the QEF programme mentioned in paragraph 7 on subsidising schools to purchase mobile computing devices for loan to needy students, the school sector agrees that the programme can help implement the blended mode of learning and teaching, and has achieved great success in meeting the educational needs of the disadvantaged students. Comments from the participating schools show that stakeholders in general suggested that the programme, originally set to end in late August 2024, be extended for three years up to the 2026/27 school year, so as to allow sufficient time to collect more comprehensive data for formulating long-term measures on supporting needy students to use IT in learning. The suggestion has been endorsed by the QEF Steering Committee.

Mainland and overseas exchanges

26. With the country pressing ahead with the promotion of digital education in recent years, we need to understand the policies and successful experiences of the Mainland in related matters, which will provide reference for us in formulating relevant policies and support measures for Hong Kong. The Secretary and the Under Secretary for Education attended the World Digital Education Conference co-organised by the Ministry of Education and the Chinese National Commission for UNESCO in 2023 and 2024 respectively, during which they exchanged and shared experiences with experts from the Mainland and other parts of the world. A delegation of the EDB will visit the education authority, universities, schools and technology enterprises in the Guangdong Province in the second half of June to learn about IT education in the Greater Bay Area, including the latest development in the application of AI in learning and teaching as well as the AI curricula in the region. In addition, to broaden the horizons of school heads and teachers

in respect of the application of AI in learning and teaching, EDB organises overseas study tours for teachers to attend events such as educational technology conferences, forums and exhibitions, and visit local schools and IT sector to enrich their experience. Meanwhile, the Learning and Teaching Expo organised by the HKEdCity will continue to invite scholars and experts in the education sector and the industry from all over the world, including the Mainland, to share and exchange information on the application of AI in learning and teaching.

Review the effectiveness of measures and conduct relevant studies

27. The EDB will continue to learn the implementation of ITE in schools through various channels, conduct timely reviews and consolidate the experiences in promoting e-learning with a view to enhancing the measures to promote ITE. We will also explore the successful experiences of the Mainland schools in the applications of IT in teaching as well as the related professional training by conducting research studies and visits for our reference in formulating/enhancing ITE-related policies and support measures, as well as for deepening the exchange and collaboration on ITE between the two places.

Advice Sought

28. Members are invited to note the current situation of ITE in schools, and comment on the support measures as stated in the paper and the way forward for ITE.

Education Bureau
June 2024

Annex 1

QEF e-Learning Ancillary Facilities Programme

List of Projects

No.	Project Title	Grantee	Project Profile	Beneficiaries
1	Intelligent DEsign-Aware Learning analytics empowered 21C L&T System (IDEALS)	The University of Hong Kong, Faculty of Education - Centre for Information Technology in Education	To develop an AI system for learning design and analysing learning by teachers.	Primary school Secondary school
2	E-Learning Platform of Chinese Art History and 3D Paintings	Department of History, Hong Kong Baptist University	To establish a learning platform themed on ancient Chinese paintings to support students in studying the history of art development and Chinese history.	Primary school Secondary school
3	Using Big Data to 「Teach precisely, Learn efficiently」to further Develop One-stop Learning Management System and e-Learning resources to cater for different learning needs	Sam Shui Natives Association School Fund Limited	To develop a learning platform for students with special educational needs and a set of games to support students with dyslexia in learning English.	Primary school Special school
4	The use of Algorithms and AI technologies to enable Adaptive learning in Mathematical Education	The Chinese University of Hong Kong - Department of Mathematics	To set up an adaptive e-learning system for secondary Mathematics education.	Secondary school
5	EduVenture® Self-directed Learning Resources Programme: General Studies in Primary Education and Citizenship and Social Development in Secondary Education EduVenture®	Centre for Learning Sciences and Technologies (CLST), The Chinese University of Hong Kong (CUHK)	To incorporate AI technology into the EduVenture e-learning platform and develop relevant courseware to support field trip learning for General Studies (including the Primary Science subject and Primary Humanities subject to be implemented soon) as well as the	Primary school Secondary school

No.	Project Title	Grantee	Project Profile	Beneficiaries
			Citizenship and Social Development subject at senior secondary level.	
6	Geography E-learning Package about Climate Change, Version 2.0	Ho Koon Nature Education cum Astronomical Centre	To develop learning and teaching resources related to climate change with augmented reality (AR)/virtual reality (VR) technologies.	Secondary school
7	Enhancing Literacy Education with Artificial Reality Neo-platform (eLEARN) 2.0	The University of Hong Kong, Faculty of Education - Centre for Information Technology in Education	To develop an immersive learning platform aided by VR to facilitate the learning of Chinese Language, English Language and the General Studies (including the Primary Science subject and Primary Humanities subject to be implemented soon) in primary schools.	Primary school
8	Apply AI teaching and classroom management skill practice for pre-service teachers in Field Experience	Department of Special Education and Counselling, The Education University of Hong Kong	To develop a platform which uses AI to help pre-service teachers enhance teaching and classroom management skills.	Primary and secondary pre-service teachers
9	Digital Physical Quotient and Learning Platform	Department of Rehabilitation Sciences, The Hong Kong Polytechnic University	To establish an AI platform which can collect and analyse data on children's gross motor and fine motor for assessing the development of their kinesthetic intelligence.	Kindergarten Primary school Special school
10	Metaverse English Learning World - AI Companion Robot and Virtual Environment to foster Students' English Speaking Skills	Chinese Young Men's Christian Association Of Hong Kong	To develop a learning platform which uses chatbot technology to train students' English listening and speaking skills.	Primary school Secondary school

No.	Project Title	Grantee	Project Profile	Beneficiaries
11	Dissemination of Borderless Lab365 platform to secondary and primary students	Department of Applied Physics, Hong Kong Polytechnic University	To develop a platform for remote-controlled experiments so that students can conduct science experiments free from time and place constraints.	Primary school Secondary school
12	Animation, Coding, Cognitive Tool as Pedagogies for Subject Learning, Self-Regulated Learning, and Computational Thinking Development: Coding, Chinese Language, English Language, and Mathematics	Department of Mathematics and Information Technology, The Education University of Hong Kong	To develop an e-learning platform which uses tools such as coding to facilitate students' learning of relevant subjects and cultivate their self-learning and computational thinking skills.	Primary school
13	Revitalizing Open English Materials Through Multimedia Components and Creation of a Mobile Application to Support LTI: Facilitating Blended Learning and Self-Directed Learning for Primary 1 to Secondary 6	Hong Kong Metropolitan University - Office for Advancement of Learning and Teaching	To develop a set of open source English textbooks complemented with multimedia materials and interactive functions to support the learning and teaching of English in primary and secondary schools.	Primary school Secondary school
14	AI-assisted Virtual Reality English Speaking Program for Secondary Students	Center for Language Education, The Hong Kong University of Science and Technology	To develop an AI system for training English speaking, including VR software to provide immersive learning.	Secondary school
15	Use innovative technology to make assessment paper interactive, collect learning data and generate analysis automatically	Xianggang Putonghua Yanxishe	To develop a conversion system which can electronically convert paper-based assessment materials for automatically marking and analysing student learning with feedback.	Primary school

No.	Project Title	Grantee	Project Profile	Beneficiaries
16	Learning Management System and Knowledge Management with Artificial Intelligence and Big Data	The University of Hong Kong - Department of Electrical & Electronic Engineering	To develop a learning and teaching platform to provide teaching resources and databases, and analyse students' learning progress with AI.	Primary school Secondary school
17	Developing e-Content for Robotics Education: Using Learning Management System to Promote Blended Learning Model and Content Sharing	Department of Curriculum and Instruction, The Education University of Hong Kong	To develop an e-course related to robotic making and a learning management platform to provide learning resources and allow students to share their learning outcomes through the platform.	Primary school Secondary school
18	Programming e-Learning and Assessment Platform	Hong Kong Young Women's Christian Association (HKYWCA)	To develop a learning and assessment platform for coding to support teachers in teaching the Information and Communication Technology Curriculum updated recently.	Secondary school
19	LingoTask: An AI-Powered English Teaching and Learning System	Stanley Ho Big Data Decision Analytics Research Centre, the Chinese University of Hong Kong	To develop an AI platform for learning and teaching English which can automatically assess students' performance in listening, speaking, reading and writing.	Primary school Secondary school
20	'Learning & Teaching' Made Easier	Sik Sik Yuen	To develop an e-platform for promoting adaptive learning to facilitate teachers in implementing learning and teaching activities and assessing student learning.	Primary school Secondary school

No.	Project Title	Grantee	Project Profile	Beneficiaries
21	A New Learning Era of Learning, Evaluation and Teaching	Yan Chai Hospital Board of Directors	To develop an e-learning platform for Senior Secondary English Language, using AI to assess and analyse students' learning performance with immediate feedback.	Secondary school
22	Knowledge Overlord - A self-sustaining AI game-based online platform to enhance student's literacy ability and 21st century skills	Hong Kong Metropolitan University - School of Nursing and Health Studies	To develop an e-learning platform which promotes reading with the application of AI and games, and establish an online reading community to enhance students' language proficiency.	Primary school Secondary school

Annex 2

A list of professional development programmes organised for teachers in the 2023/24 school year (up to April 2024)

These programmes include e-leadership, technological, pedagogical, subject-related, information literacy and blended learning series.

e-Leadership Series

1.	The Future of Artificial Intelligence (AI) in Education
2.	Application of Artificial Intelligence (AI) Tools to Enhance Learning and Teaching Effectiveness in Primary and Secondary Schools (Basic Level)
3.	Experience Sharing on Planning and Implementation of e-Learning (Primary Schools)
4.	Experience Sharing on Planning and Implementation of e-Learning (Primary Schools) (Basic Level) (Online Self-learning Course)
5.	Implementation of "Bring Your Own Device" (BYOD) with Practical Examples
6.	Successful Practice of Implementing "Bring Your Own Device" (BYOD) Policy in Primary Schools
7.	Practical Examples and Skills in Managing e-Learning Devices in Schools (Basic Level)
8.	Using Cloud Platform Tools to Support Teachers' Routines in Schools (Basic Level) (Online Self-learning Course)
9.	Using an IT Tool for Comprehensive Learning and Teaching Related Data Analysis and Visualisation in Schools (Basic Level)
10.	HK e-Learning, Artificial Intelligence (AI), STEAM & Coding Education Study Tour to the United Kingdom (UK) and France

Technological Series

1.	Virtual Reality and Its Applications in Education (Basic Level)
2.	Virtual Reality and Its Applications in Education (Basic Level) (Intake 1, 2023/24 Online Self-learning Course)
3.	Virtual Reality and Its Applications in Education (Basic Level) (Intake 2, 2023/24 Online Self-learning Course)
4.	Virtual Reality and Its Applications in Education (Advanced Level – Primary School)
5.	Virtual Reality and Its Applications in Education (Advanced Level – Secondary School)
6.	Application of Virtual Reality (VR) and Augmented Reality (AR) Tools in Education (Basic Level) (Online Self-learning Course)

7.	Applications of Virtual Reality (VR) and Augmented Reality (AR) Tools in Education (Advanced Level)
8.	Using 360-degree Panorama, Virtual Reality (VR) and 3D Modeling Technologies to Create a Virtual School Tour (Basic Level)
9.	Using e-Learning Tools for Augmented Reality (AR) Book Production (Basic Level)
10.	Using e-Learning Tools for Augmented Reality (AR) Book Production (Advanced Level)
11.	Application of Artificial Intelligence (AI) in Education (Basic Level)
12.	Application of Generative Artificial Intelligence (AI) in Education (Basic Level)
13.	Using Generative Artificial Intelligence (AI) Tools for Learning and Teaching (Basic Level)
14.	Using Generative Artificial Intelligence (AI) Tools for Learning and Teaching (Basic Level)
15.	Using e-Learning Tools to Teach Artificial Intelligence (AI) in Primary Schools (Basic Level)
16.	Using Drones for STEAM Learning Activities in Primary Schools (Basic Level)
17.	Using Drones for STEAM Learning Activities in Primary Schools (Basic Level) (Online Self-learning Course)
18.	Using a 3D Drawing Tool in STEAM Learning Activities in Primary Schools (Basic Level)
19.	Using Internet of Things (IoT) Platform in STEAM Learning Activity (Basic Level)
20.	Using Internet of Things (IoT) Platform and Sensors in STEAM Learning Activity (Basic Level)
21.	Using Robotics to Facilitate Cross-disciplines Learning Activities (Basic Level)
22.	Using Microcomputer Sets to Develop Students' Problem-Solving and Coding Skills (Basic Level) (Online Self-learning Course)
23.	Using Artificial Intelligence (AI) Programming Tools in STEAM Learning Activities (Basic Level) (Online Self-learning Course)
24.	Using Artificial Intelligence (AI) Programming Tools in STEAM Learning Activities (Advanced Level)
25.	Using the Drawing Feature of Python to Learn Coding, Drawing and Graphic Design (Basic Level) (Online Self-learning Course)
26.	Introduction to and Exploration on the Use of Open Data in Schools (Advanced Level)
27.	Application of E-textbook – Innovative Practice in Education (Basic Level)
28.	Using e-Learning Tools for Multimedia Design and Educational Video Editing (Basic Level)

29.	Using e-Learning Tools to Record and Edit Teaching Videos (Basic Level) (Online Self-learning Course)
30.	Management of e-Learning Platform Accounts (Basic Level) (Online Self-learning Course)
31.	Management of Learning Management System (LMS) (Basic Level)
32.	Management of Learning Management System (LMS) (Basic Level) (Online Self-learning Course)
33.	Using Learning Management System (LMS) to Enhance Learning and Teaching Effectiveness in Secondary Schools (Advanced Level)
34.	Management, Security and Maintenance of School IT Facilities – Learning Management Systems (LMS) in Schools
35.	Management, Security and Maintenance of School IT Facilities – Computer Networking in Schools
36.	Management, Security and Maintenance of School IT Facilities – System Security in Schools
37.	Management, Security and Maintenance of School IT Facilities – Mobile Device Management (MDM) in Schools
38.	Management, Security and Maintenance of School IT Facilities – Management of Webservers and Webpages in Schools
39.	Management, Security and Maintenance of School IT Facilities – Backup and Restoration of Files and Operating Systems in Schools
40.	Management, Security and Maintenance of School IT Facilities – Management of Active Directory (AD) in Schools (Basic Level)
41.	Management, Security and Maintenance of School IT Facilities – Management of Active Directory (AD) in Schools (Advanced Level)

Pedagogical Series

1.	Using a Note-taking Tool to Facilitate Learning and Teaching (Basic Level) (Online Self-learning Course)
2.	Using Learning Management System (LMS) to Enhance Learning and Teaching Effectiveness (Basic Level)
3.	Using IT Tools for Assessment Data Analysis and Feedback (Basic Level)
4.	Using IT Tools for Learning Outcomes Demonstration to Enhance Evaluation and Develop Creativity (Basic Level)
5.	Using e-Learning Tools to Enhance e-Assessment in Primary Schools (with General Studies as an Example) (Basic Level)
6.	Using e-Learning Tools to Enhance e-Assessment for Mathematics in Primary Schools (Basic Level)
7.	Using e-Learning Tools to Promote Drawing and Creative Design in Primary Schools (Basic Level)
8.	Using an e-Learning Tool to Enhance Extended Learning and Students' Learning Motivation (Basic Level) (Online Self-learning Course)

9.	Using e-Learning Tools to Cater for Learner Diversity (Basic Level)
10.	Using e-Learning Tools to Cater for Learner Diversity (Basic Level) (Online Self-learning Course)
11.	Using e-Learning Tools to Cater for Learner Diversity (using Primary English Language as example) (Basic Level)
12.	Using an e-Learning Tool to Support the Learning and Communication for Students with Special Educational Needs (Basic Level)
13.	Using e-Learning Tools to Facilitate Self-directed Learning and Differentiated Teaching in Primary Schools (with Chinese Language as an Example) (Basic Level)
14.	Using e-Learning Tools to Facilitate Self-directed Learning and Differentiated Teaching in Primary Schools (with English Language as an Example) (Basic Level)
15.	Using e-Learning Tools to Facilitate Self-directed Learning and Differentiated Teaching in Primary Schools (with Mathematics and General Studies as Examples) (Basic Level)
16.	Using e-Learning Tools to Enhance Effectiveness of Learning Chinese for Non-Chinese Speaking (NCS) Students (Basic Level)
17.	Exploration of the Beauty of the Forbidden City through Gamified Learning (Basic Level)
18.	A Breakthrough in Oral History – Application of Facial Recognition Technology (Basic Level) (Online Self-learning Course)
19.	Using e-Learning Tools to Promote Students' Reading Interest in Primary Schools (Basic Level)
20.	Using e-Learning Tools to Cultivate Students' Creativity and Problem Solving Skills in STEAM Learning Activity (Basic Level)
21.	Using e-Learning Tools to Enhance Scientific Inquiry and Students' Hands – on Abilities for STEAM Learning Activities (Basic Level)
22.	Using Drones and e-Learning Devices for STEAM Cross-disciplines Coding Learning Activities in Primary and Secondary Schools (Basic Level)
23.	Using e-Learning Tools to Implement STEAM Learning Activities in Primary Schools (Basic Level)
24.	Using Robot Kit to Cultivate Students' Computational Thinking in Primary Schools (Basic Level)
25.	Using Robot Kit and Unplugged Activity to Cultivate Students' Computational Thinking in Primary Schools (Basic Level)
26.	Use of 3D-Modeling Tools and Artificial Intelligence (AI) to Enhance Learning and Teaching Effectiveness in Primary Schools (Basic Level)
27.	The Use of Artificial Intelligence (AI) in Coding Education and the Related Ethical issues (Basic Level)
28.	Using Artificial intelligence (AI) for Picture Books Creation in Primary

	Schools (Basic Level)
29.	Using Virtual Reality (VR) for Community Tour in Primary Schools (Basic Level)

Subject-related Series

1.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for Chinese Language in Primary Schools (Basic Level)
2.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of Chinese Language Subject in Primary Schools (with Class Observation) (Basic Level)
3.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for Chinese Language in Primary Schools (Basic Level) (Online Self-learning Course)
4.	Using e-Learning Tools to Design Chinese Language Lessons in Primary Schools (Basic Level)
5.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of School-based Picture Books Curriculum of Chinese Language (Basic Level)
6.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of School-based Picture Books Curriculum of Chinese Language (Basic Level) (Online Self-learning Course)
7.	Using Virtual Reality (VR) for Learning and Teaching of Chinese Language in Primary Schools (Basic Level)
8.	Using Generative Artificial Intelligence (AI) Tools to Create Learning Materials for Chinese Language (Basic Level)
9.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for English Language in Primary Schools (Basic Level)
10.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for English Language in Primary Schools (Basic Level) (Online Self-learning Course)
11.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness in Primary Schools English Language (with Class Observation) (Basic Level)
12.	Using an e-Learning Tool to Design English Language Lessons in Primary Schools (Basic Level)
13.	Using e-Learning Tools to Promote Assessment for Learning for English Language in Primary Schools (Basic Level)
14.	Using e-Tools to Create Learning Materials for English Language in Primary Schools (Basic Level)
15.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for Mathematics in Primary Schools (Basic Level)
16.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for Mathematics in Primary Schools (Basic Level) (Online Self-learning

	Course)
17.	Using an e-Learning Tool to Enhance Learning and Teaching Effectiveness for Mathematics in Primary Schools (Advanced Level) (Online Self-learning Course)
18.	Using e-Learning Tools to Enhance e-Assessment for Mathematics in Primary Schools (Basic Level) (Online Self-learning Course)
19.	Using e-Learning Tools to Enhance e-Assessment for Mathematics in Primary Schools (Advanced Level)
20.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of General Studies in Primary Schools (Basic Level)
21.	Using an e-Learning Tool to Design General Studies Lessons in Primary Schools (Basic Level)
22.	Using e-Learning Tools to Enhance e-Assessment for General Studies in Primary Schools (Basic Level) (Online Self-learning Course)
23.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of Putonghua in Primary Schools (Basic Level)
24.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness for Visual Arts in Primary Schools (Basic Level)
25.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of Visual Arts in Primary Schools (Basic Level) (Online Self-learning Course)
26.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of STEAM Learning Activities (with School Tour) (Basic Level)

Information Literacy Series

1.	Information Literacy Education in Primary and Secondary Schools – Information Literacy Related Concepts and Issues (Basic Level) (Online Self-learning Course)
2.	Information Literacy Education for Primary Schools (Basic Level)
3.	Information Literacy Education for Primary Schools (Basic Level) – Strategies of Implementing School-based Information Literacy Education
4.	Information Literacy Education for Primary Schools (Basic Level) – Strategies for Teaching Ethical Issues arising from the Application of Emerging and Advanced Information Technologies
5.	Information Literacy Education for Secondary Schools (Basic Level) – Implementing Information Literacy Education
6.	Information Literacy Education in Secondary Schools – Planning and Implementation of School-based Information Literacy (IL) Curriculum in Whole-School Approach (Basic Level)
7.	Information Literacy Education in Secondary Schools – Recognise the ethical issues arising from the application of emerging and advanced information technologies (Basic Level)

8.	Information Literacy Education in Secondary Schools − Promoting Information Literacy Education in Chinese Language (Basic Level)
9.	Information Literacy Education in Primary Schoo − Planning, Implementation and Evaluation of School-based IL Curriculum in Whole-School Approach (Advanced Level)
10.	Information Literacy Education in Primary Schools − General Studies (Advanced Level)
11.	Information Literacy Education in Primary Schools − Developing Students' Ethical and Positive Use of Emerging and Advanced Information Technologies (Advanced Level)
12.	Information Literacy Education in Secondary Schools − Planning, Implementation and Evaluation of School-based IL Curriculum in Whole-School Approach (Advanced Level)
13.	Information Literacy Education in Secondary Schools – Citizenship and Social Development (Advanced Level)
14.	IT in Education Information Literacy Series: Information Literacy Education in Secondary Schools − Developing Students' Ethical and Positive Use of Emerging and Advanced Information Technologies (Advanced Level)
15.	Intellectual Property and the Related Ethical Issues in Emerging and Advanced IT (Primary Schools)
16.	Information Evaluation and Cyberbullying (Primary Schools)
17.	Intellectual Property and the Related Ethical Issues in Emerging and Advanced IT (Secondary Schools)
18.	Information Evaluation and Cyberbullying (Secondary Schools)
19.	Supporting Parents on e-Learning (Primary Schools)
20.	Supporting Parents on e-Learning (Secondary Schools)

Blended Learning Series

1.	Using e-Learning Tools to Develop Students' Creativity (Basic Level)
2.	Experience Sharing on the Implementation of Blended Mode of Learning (Basic Level)
3.	Promoting Blended Learning in Primary Schools
4.	Using e-Learning Tools to Promote Blended Learning in Primary Schools (Basic Level)
5.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness of Blended Mode of Learning in Primary Schools (Basic Level) (Online Self-learning Course)
6.	Using e-Learning Tools to Enhance Learning and Teaching Effectiveness

	of Blended Mode of Learning in Primary Schools Chinese Language (Basic Level)
7.	Using e-Learning Tools to Enhance Blended Mode of Learning in Primary Schools Chinese Language (with Class Observation) (Basic Level)
8.	Using e-Learning Tools to Enhance Blended Mode of Learning for English Language in Primary Schools (Basic Level)
9.	Using e-Learning Tools to Enhance Blended Mode of Learning in Primary Schools English Language (with Class Observation) (Basic Level)
10.	Using e-Learning Tools to Promote Blended Learning for Mathematics in Primary Schools (with Class Observation) (Basic Level)
11.	Using e-Learning Tools to Enhance Blended Mode of Learning in General Studies of Primary Schools (with Class Observation) (Basic Level)
12.	Using e-Learning Tools to Promote Blended Mode of Learning for Putonghua in Primary Schools (Basic Level)
13.	Promoting Blended Learning in Secondary Schools