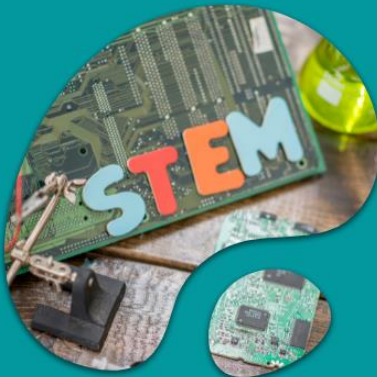# 2022 Online Survey on STEM Education
SURVEY REPORT

"Online Survey – Nurturing Our Home-grown STEM Talent 2022"
Survey Report

for
Hong Kong Productivity Council (HKPC)

Dec 2022

Table of Contents   Page

Part 1　Background

1.1　Background of the Survey

In early 2022, the Hong Kong Productivity Council (HKPC) conducted a survey that aimed to gauge views on the current situation and challenges in the implementation of STEM (Science, Technology, Engineering and Mathematics) education, explore the resources and policy support for nurturing future talents, and analyse the effectiveness and development potential of implementing STEM in the market.

The results of the survey would be announced in a press event at the end of 2022 and in other publicity occasions. HKPC might drive relevant programmes to promote STEM or bridge the gaps identified in the survey.

This quantitative research consolidated the views and opinions of parents and STEM teachers (plus other relevant educators) on their expectations and requirements of STEM curriculum as well as future skills, with an aim to help talents equip for future challenges.

The survey was commissioned by HKPC together with the Hong Kong Federation of Education Workers TechEd Centre (HKFEW TechEd Centre) and the College of Professional and Continuing Education Limited of The Hong Kong Polytechnic University (PolyU CPCE).

1.2　Objectives of the Survey

- To obtain general awareness, understanding and experience in learning and teaching STEM amongst educators and parents and discover any untapped subjects and skills that would be beneficial to students
- To identify gaps in the level of achievement or experience in STEM education by understanding how STEM is taught or being implemented in schools
- To understand how resources are being utilised and policies are being executed to better improve and support the training of future talents
- To evaluate the effectiveness of implementing and developing TechEd and propose feasible solutions and assistance to nurture future talents

1.3 Target Respondents

The survey aimed to gain insights from two target segments:

a) Parents with children attending primary or secondary schools in Hong Kong

b) Educators (including school principal, teacher/ curriculum leader or STEM instructor/ service provider) who are teaching or supporting STEM education

To obtain responses from educators, potential respondents from education and relevant industry organisations[1] were invited. For parent respondents, invitations were sent to relevant parent networks or posted on social media to encourage participation.

1.4 Methodology

The survey began with a comprehensive desktop research and an in-depth interview with the client at planning stage. A series of informal interviews were conducted among potential stakeholders, such as parents, teachers or committees who involved in developing STEM subjects, so as to obtain their initial views on STEM, and to develop the scope of survey and the questionnaires.

The length of the survey was approximate 10 minutes to minimise respondent fatigue. By using an online survey approach, potential respondents who were not Internet savvy or infrequent online users might be excluded. The survey was available in Chinese and English[2] to ensure respondents were comfortable to participate in their language of choice.

Potential respondents were invited to participate via various channels, relevant organisations or social media platforms. Once potential respondents had read the invitation[3] and understood the survey, they simply clicked through a hyperlink to begin.

To protect data privacy, respondents were not required to provide any personal information. Results were aggregated for analysis, reported collectively and would not be referred to individually. However, should any respondents be interested to learn more about STEM (from HKPC), they could leave their email address for further information.

Since the results of this survey were not weighted against any population composition or standards, e.g. age distribution of parents in Hong Kong or STEM teachers, the results of the survey should not be used for sizing projections.

[1] 香港電腦教育學會, 香港資優教育學苑, 香港教育工作者聯會, 聯校資訊科技學會, 香港理工大學專業及持續教育學院, 家庭與學校合作事宜委員會, 政府資訊科技總監辦公室, 香港電腦商會

[2] The 4 versions of survey questionnaire (Appendix 1-4)

[3] The invitation email and social media post (Appendix 5)

1.5   Fieldwork Timeline

The online survey was conducted from September 15 to October 19, 2022. During the survey period, two notable events took place that might impose some impacts to the results:

a) In the first week of October, the China Manned Space Agency announced to recruit payload specialists from Hong Kong and Macau, gaining widespread media attention in Hong Kong.

b) The Chief Executive attached great importance to STEAM education and youth development in 2022 Policy Address (announced on 19 October, 2022).

1.6   Fieldwork Response

Target	Completed
Parent	777
Parents with responses on STEM	531
- With children in primary school	*433*
- With children in secondary school	*98*
Educator	314
- Teacher/ Curriculum leader	*176*
- STEM teacher/ instructor	*94*
- STEM instructor (non-teaching staff)	*6*
- School/ deputy principal	*38*

Part 2 Executive Summary

This executive summary outlined the results of the survey of both parent and educator segments, compared and contrasted perspectives and highlighted key implications.

STEM education should start early, compulsory and formalised to become a formal school curriculum – STEM has become the fundamental of education

79% of parents agreed that STEM should be a *formal school curriculum*. 44% also cited an important factor to implement STEM effectively was that *STEM education should be a compulsory subject with more teaching assistance*.

Parents saw the potential in STEM education as 39% would strongly encourage their children to study STEM disciplines at tertiary education. Another 36% would encourage their children to study STEM in the future even though their children were not familiar with STEM.

86% of parents and 81% of educators said that STEM should start in primary school, of which 44% of parents and 36% of educators preferred to start from Primary 1 to 3. This indicated their preference to get an early start as STEM has almost become the fundamental of education.

STEM needs dedicated resources and continuous training for teachers – Teachers can keep up-to-date with the latest technologies, sufficient resources and support to implement STEM effectively

Teachers felt they lacked knowledge and experience to implement STEM as 82% felt their experience and knowledge were insufficient or just fair. STEM teachers were also fairly inexperienced as 40% had only taught STEM for 2 years or less.

31% of responded teachers studied STEM disciplines at universities. While the rest of the teachers took external training courses alongside their full-time jobs, 55% claimed that they learned STEM based on their personal experience and e-learning.

Both parents and educators felt that there should be more support and resources on manpower, hardware and environment. In general, only 10% of parents and 17% of educators thought there were sufficient resources in school for STEM.

Teachers felt that *increase manpower support in teaching STEM and administrative duties* (66%), *more facilities and equipment for teaching STEM* (59%) and *provide continuous training to keep up-to-date with latest technology development* (57%) were the top 3 factors in facilitating STEM teaching.

Parents believed the top driver to help implement STEM education effectively was *school to set up more "Smarter Campus" facilities & equipment to enable students with more access to technology* (58%).

Parents want to learn STEM as well – Inadequate understanding of STEM and want to learn together with their children

51% of the parents thought that STEM was *a subject to learn new technologies*, 34% as *a subject of general studies, science, mathematics in the regular school curriculum* and 10% as *an extra-curriculum provide the school*. To most parents, STEM remained as a subject to be learned and only a few treated it as an extra-curriculum activity in school instead of an approach to learning.

Also, 57% of parents wished for *a variety of STEM workshops or activities for themselves (parents) and children (students) to keep up-to-date with the latest technologies and talent development in respective technological fields.*

Equip young talents with anticipated emerging technologies or future skills – Bridge the gaps between current courses and essential future skills

Currently, the most popular STEM courses enrolled were Coding/ Computer Programming (59%), followed by AI/ Robotics (35%) and Electronic or Online Games/ eSports (27%). Enrolled courses were usually a function of available courses and affordability.

In comparison, 75% of parents and 80% of educators thought the top emerging technologies or future skills for students to prepare for their future was AI/ Machine Learning. Others thought that Data Analytics (51% parents, 54% educators) and Cyber Security (50% parents, 54% educators) were also essential. Others emerging technologies included Green Technology and Sustainability, Multi-media Design, Robotics Engineering and Cloud Computing. There may probably be demands for these new emerging technologies as technology education becomes increasingly crucial to equip young talents for their future.

STEM education will inevitably continue to evolve. With the growing trend to nurture home-grown STEM talents, education authority will need to provide clear direction on STEM curriculum, education sector will require dedicated resources and continuous training, and the support plus understanding from parents will also be essential. It is imperative that with the collaboration of these parties, STEM or technology education can be implemented effectively to equip young talents to face future changes and challenges.

Part 3   Main Results

3.1   Parent Survey

3.1.1   Profile of Parent Respondents

Parents who responded were mostly parents of primary school students, as 50% had children aged 6 to 9, 32% aged 10 to 12, 12% aged 13 to 15 and 6% aged 16 to 18. 56% of their children were studying in aided school, 22% in government school, 11% in direct subsidy scheme school, 6% in international school and 4% in private school.

- 6 to 9 years old
- 10 to 12 years old
- 13 to 15 years old
- 16 to 18 years old

- Government school — 22%
- Aided school — 56%
- Direct subsidy scheme school — 11%
- International school — 6%
- Private school — 4%
- Other — 1%
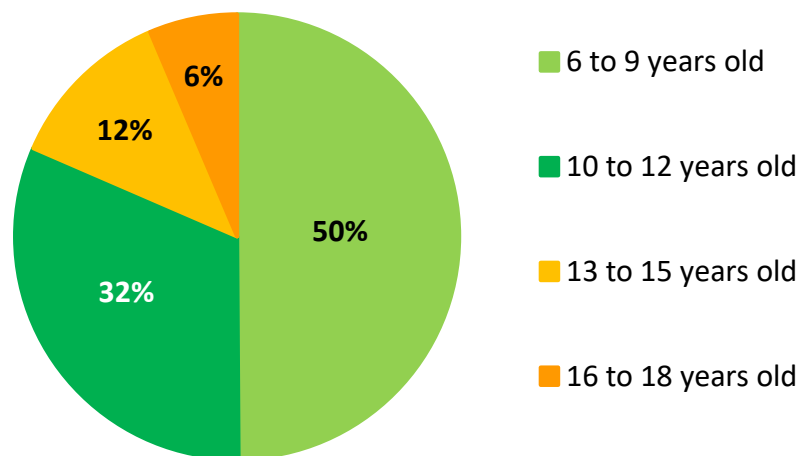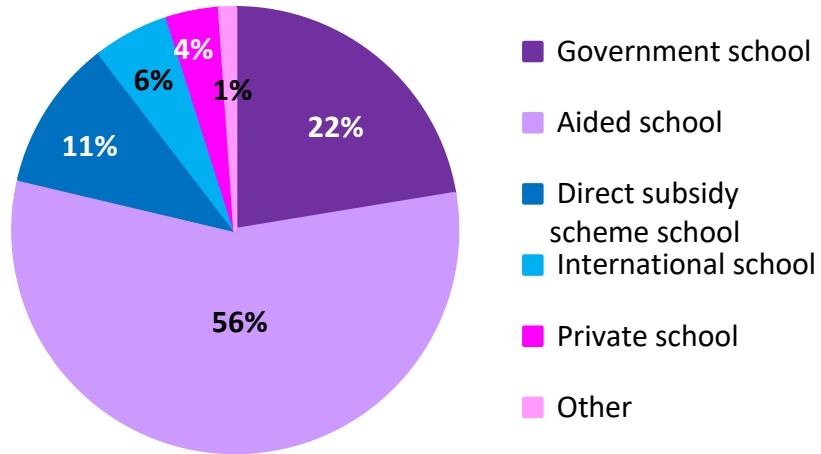
[Q1/ Q2]

75% of the respondents were females. Age of parents ranged from the twenties to the sixties with 34% aged 41-45, 26% aged 36-40, 18% aged 46-50, 10% aged 31-35 and 8% aged 51-55.

■ <25 ■ 25-30 ■ 31-35 ■ 36-40 ■ 41-45 ■ 46-50 ■ 51-55 ■ 56-60 ■ 60+
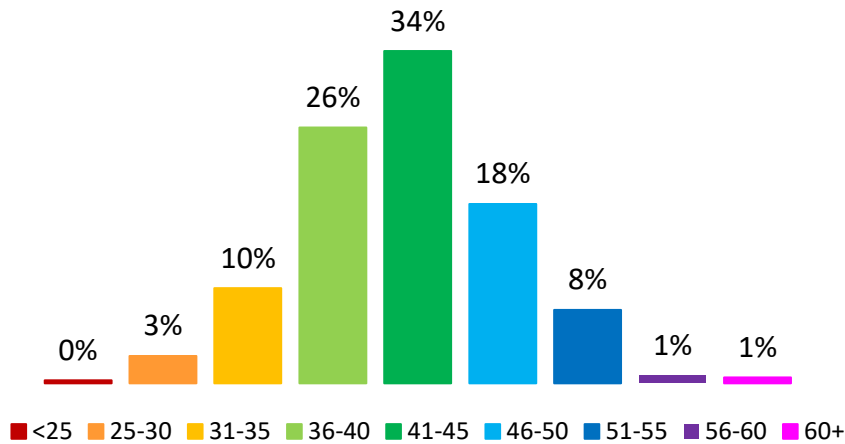
46% of parent respondents were graduates (30% with bachelor degrees, 14% with master degrees and 2% with PhDs), 18% with pre-college or university education and 35% had secondary school education.

- Primary school
- Secondary school
- Pre-college/ university
- Bachelor Degree
- Master Degree
- PhD
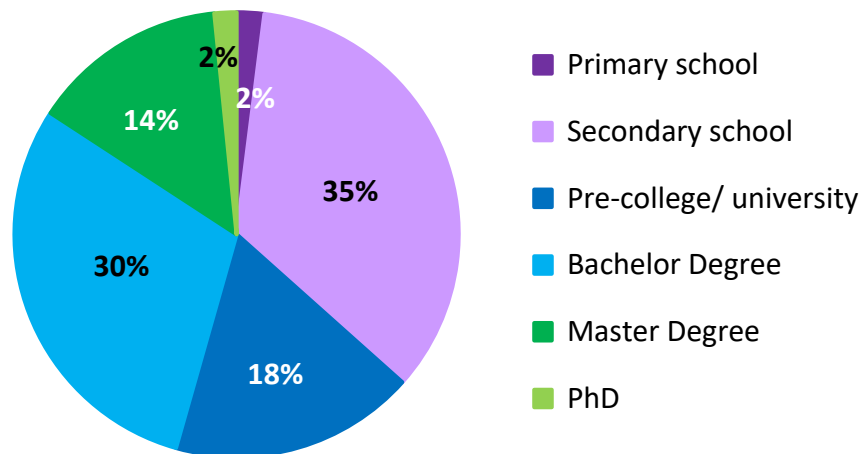
[D1/D2/D3]

3.1.2 Definition of STEM and Extra-curricular activities

3.1.2.1 Definition of STEM education

When asked to describe which description *best fits STEM education*, 51% thought that STEM was *a subject to learn new technologies*, 34% *a subject of general studies, science, mathematics in the regular school curriculum* and 10% *an extra-curriculum provided by the school.* STEM was recognised among parents as either a subject in school or an ECA.

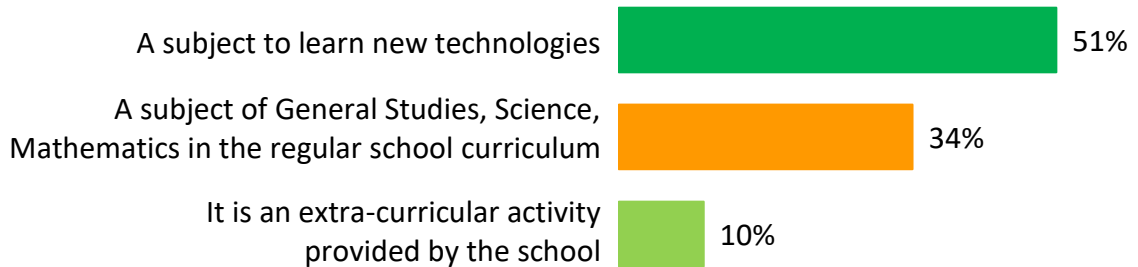|	
A subject to learn new technologies	51%
A subject of General Studies, Science, Mathematics in the regular school curriculum	34%
It is an extra-curricular activity provided by the school	10%

[Q3]

3.1.2.2 Extra-curricular activities

Currently, 48% of the children of respondents were participating in Sports activities organised by school. 28% took part in Music and Performing Arts activities at school, followed closely by 27% in STEM activities. Other activities included 19% in Arts and Craft/ Design and 15% in Foreign Languages.

Sports	48%
Music and Performing Arts	28%
STEM	27%
Arts and Craft/ Design	19%
Foreign Languages	15%
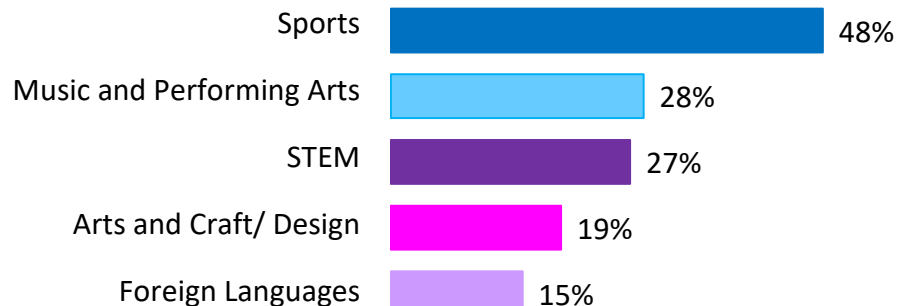
When asked whether their children were participating in any STEM activities, 47% responded that their children did not participate in any STEM activities. For those who

did participate, only 9% attended activities outside school, while 22% attended at school only, the remaining 22% responded that their children attended STEM activities both at school and outside school.

- **Yes, at school and outside school** (22%)
- **Yes, only outside school** (9%)
- **Yes, only at school** (22%)
- **No** (47%)
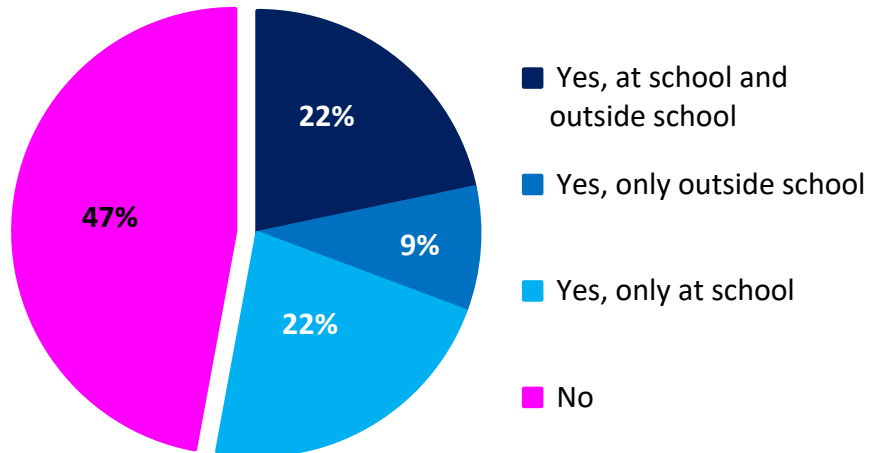
[Q4/ Q5]

When selecting STEM activities for their children, all criteria seemed to be important*. The most important factor was *learning content* (4.4); followed by *quality, reputation and experience of teacher/ STEM service provider* (4.3) and *location & facilities* (4.2). The quality of content and hardware/ software of STEM activities were more important than other criteria such as *costs* (4.0), *scheduling & lessons per week* (4.0) and *certification and qualification upon completion* (4.0). *Align with school curriculum* was least important (3.6) among these criteria.

Criteria	Costs	Location & Facilities	Schedule & Lessons per week	Learning content	Quality, reputation & experience of teacher/ STEM service provider	Certification & qualification upon completion	Align with school curriculum
Extremely important (5)	31%	36%	25%	49%	44%	28%	23%
Fairly important (4)	39%	48%	55%	45%	47%	48%	34%
Neutral (3)	26%	12%	15%	4%	9%	18%	28%

Not that important (2)	4%	3%	5%	2%	1%	6%	10%
Not important at all (1)	0.6%	0.6%	0.0%	0.0%	0.0%	0.0%	5%
Average (out of 5)	*4.0*	*4.2*	*4.0*	*4.4*	*4.3*	*4.0*	*3.6*

* Rated importance from a 5 point-scale

[Q6]

The top 3 popular STEM programmes that students currently enrolled were Coding/ Computer Programming (59%), AI/ Robotics (35%), Electronic or Online Games/ eSports (27%), followed by AR/VR (14%), Mechanical Design & Engineering (14%), Drones (11%) and Aerospace Technology (8%). Apart from popularity, these numbers probably reflected availability of courses and fees of the courses.

Coding/ Computer Programming	59%
AI, Robotics	35%
Electronic or Online Games/ eSports	27%
Augmented Reality/ Virtual Reality	14%
Mechanical Design & Engineering	14%
Drones	11%
Aerospace Technology	8%
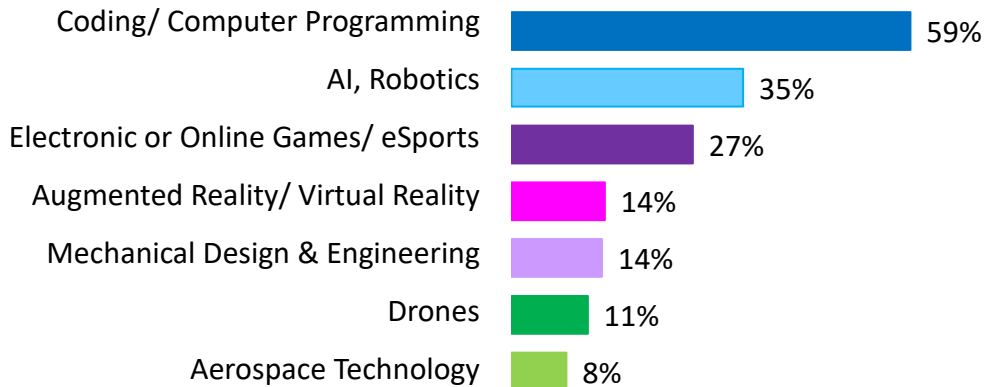
[Q7]

3.1.3 STEM Education at School

64% of responded parents knew that STEM programmes were offered in their children's schools. The rest were not attending STEM education or activities at school.

- 🟩 Yes, STEM was offered in schools — 64%
- 🟨 No, STEM was not offered in schools — 36%
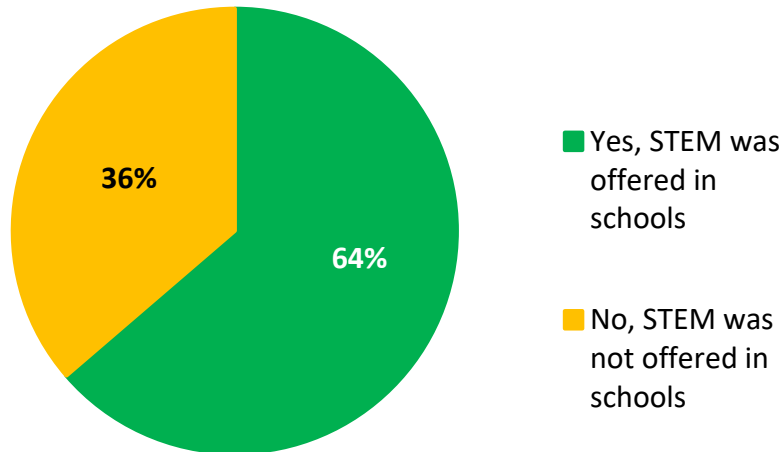
40% of the parents understood that STEM was taught via *integration into science, technology, mathematics or related subjects*. 39% said that *STEM was an extra-curriculum activity for students*. 30% said *a dedicated STEM teacher would teach or lead STEM projects/ activities in their children's schools* and 22% claimed that *STEM was part of the school curriculum and was taught by dedicated STEM teachers*.

Some schools engaged external parties to teach or lead STEM as 11% said that *external instructors were engaged to teach or lead STEM projects/ activities in the school where students might need to pay additional fees* and another 11% said that *an external service provider taught or led STEM projects/ activities funded by the school*.

It is integrated into science, technology, mathematics or related subjects	40%
It is an extra-curricular activity for students to participate	39%
A dedicated STEM teacher will teach or lead STEM projects/ activities	30%
It is part of the school curriculum and is taught by dedicated STEM teacher(s)	22%
An external instructor teaches or leads STEM projects/ activities in the school and students may have to pay additional fees	11%
An external service provider teaches or leads STEM projects/activities funded by the school	11%

[Q8/ Q9]

When asked whether there was sufficient STEM resources and support at school, only 10% felt that it was *sufficient*. 38% felt resources and support was *just fair* and another 37% felt *insufficient*.
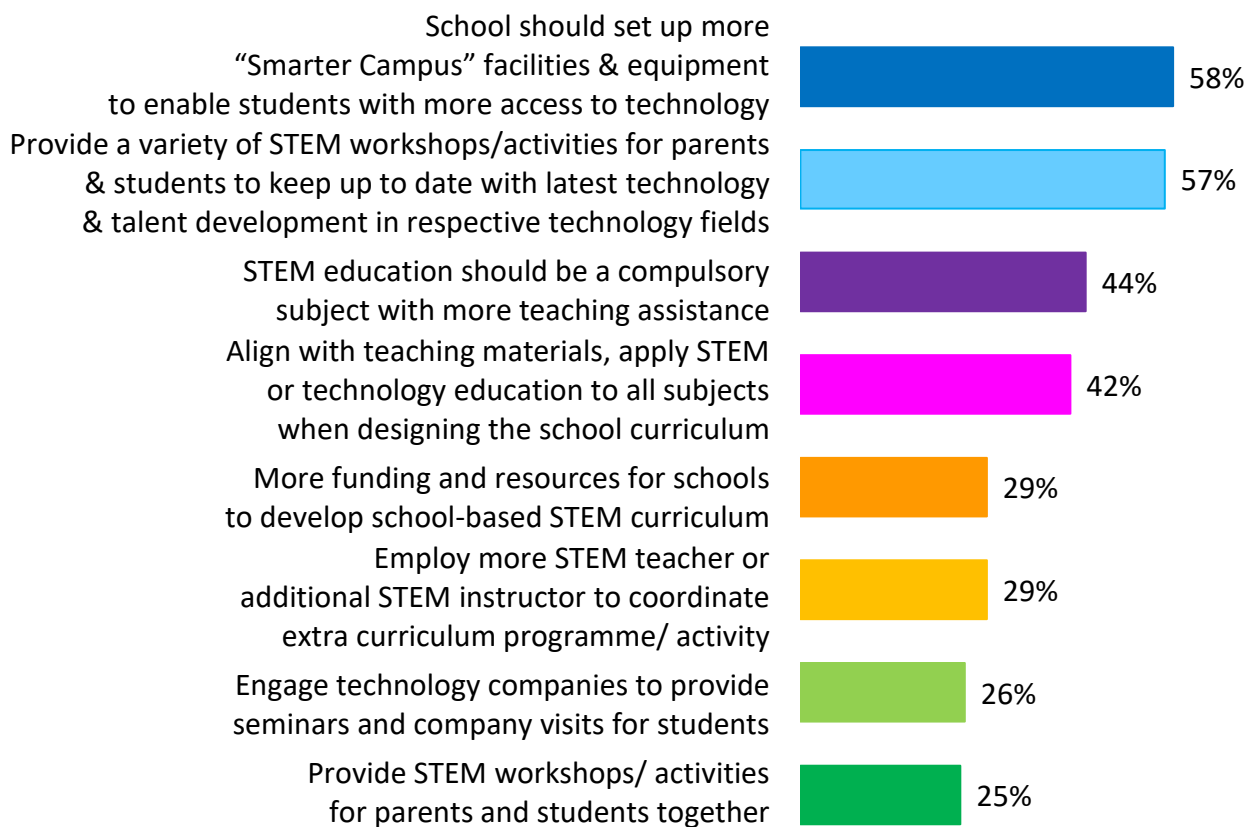
10%	38%	37%	15%

■ Sufficient   ■ Just a bit   ■ Not sufficient   ■ Not sure
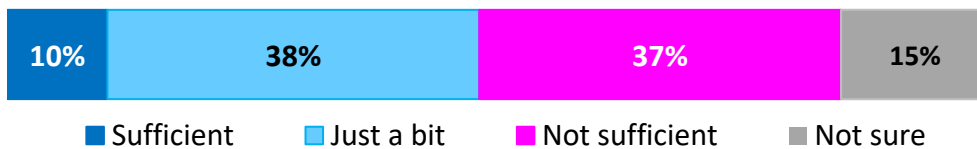
[Q10]

For the key factors to help implement STEM education effectively, the top 4 choices by parents were *school should set up more "Smarter Campus" facilities and equipment to enable students with more access to technology* (58%); *provide a variety of STEM workshops or activities for parents and students to keep up with the latest technology and talent development in respective technology fields* (57%); *STEM education should be a compulsory subject with more teaching assistance* (44%) and *align with teaching materials, apply STEM or technology education to all subjects when designing the school curriculum* (42%).

Other factors included: *more funding and resources for schools to develop school-based STEM curriculum* (29%); *employ more STEM teacher or additional STEM instructor to coordinate extra curriculum programme/ activity* (29%); *engage technology companies to provide seminars and company visits for students* (26%) and *provide STEM workshops/ activities for parents and students together* (25%).

School should set up more "Smarter Campus" facilities & equipment to enable students with more access to technology	58%
Provide a variety of STEM workshops/activities for parents & students to keep up to date with latest technology & talent development in respective technology fields	57%
STEM education should be a compulsory subject with more teaching assistance	44%
Align with teaching materials, apply STEM or technology education to all subjects when designing the school curriculum	42%
More funding and resources for schools to develop school-based STEM curriculum	29%
Employ more STEM teacher or additional STEM instructor to coordinate extra curriculum programme/ activity	29%
Engage technology companies to provide seminars and company visits for students	26%
Provide STEM workshops/ activities for parents and students together	25%

![2022 Online Survey on STEM Education - Survey Report header]

[Q11]

3.1.4 Emerging Technologies/ FutureSkills

The top emerging technology/ future skills according to the parents were:

1. AI/ Machine Learning   75%
2. Data Analytics   51%
3. Cyber Security   50%
4. Green Technology & Sustainability   39%
5. Multi-media Design   38%

Other future skills included Robotics Engineering (32%); Cloud Computing (32%); Virtual Reality/ Augmented Reality (28%); Leadership & Entrepreneurship (28%); Fintech/ Financial Knowledge (27%); Game and Video Production (25%); Aerospace Technology (21%); Storytelling/ Presentation Skills (20%) and Non-fungible token/ Block Chain (14%). [Q12]

3.1.5 Expectation on STEM

44% of the responded parents thought STEM education should start from primary 1-3; 42% from primary 4-6 and 11% from secondary 1-3.
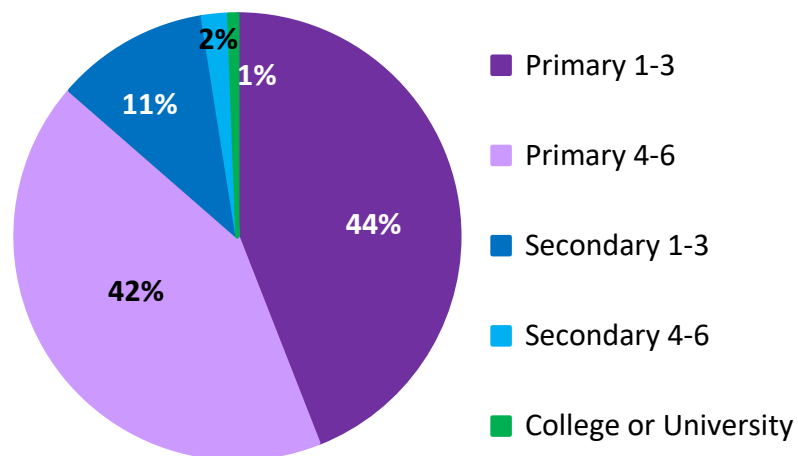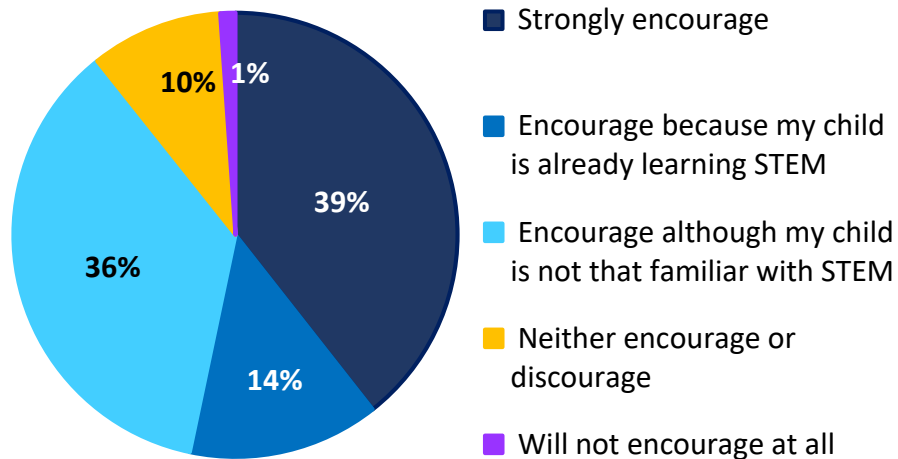
[Q13]

79% agreed that STEM should be a formal school curriculum with 37% totally agreed and 42% somewhat agreed. 19% remained neutral and only 3% disagreed.

37%	42%	19%	2% / 1%

■ Totally agree ■ Somewhat agree ■ Neutral ■ Somewhat disagree ■ Totally disagree
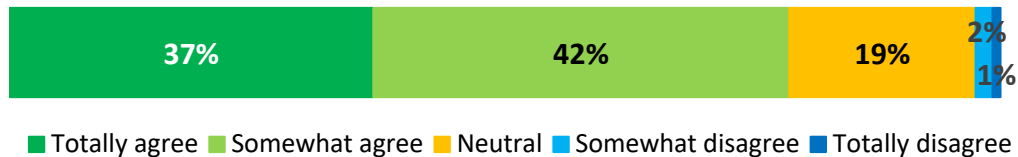
[Q14]

Parents were supportive of STEM education as 39% would strongly encourage their children to study STEM related disciplines. 36% would encourage their children to study even though their children were not familiar with STEM and 14% would encourage as their children were already learning STEM. Only 11% would neither encourage or discourage, or not encourage at all.

- Strongly encourage
- Encourage because my child is already learning STEM
- Encourage although my child is not that familiar with STEM
- Neither encourage or discourage
- Will not encourage at all

[Q14b]

3.1.6   Other Opinions on STEM Technology Education from Parents

This section summarised the highlights of the opinions. Actual verbatims are available in Appendix 6a.

Parents provided their comments on *definition and importance of STEM*:
- Not sure what STEM was - thought STEM was merely a skill or tool
- Students should learn STEM as it was important and technology would always be evolving

There were *expectations* on STEM:
- Technology was recognised as the future skills and it would substitute a lot of manual work in future.

- STEM should be for all and start as early as possible, even at the kindergarten stage.
- STEM should not be just hard skills, but also for character building.
- Parents would also like to attend STEM training themselves, wished there were more workshops for parents to participate or learn together with their children.
- STEM activities were expensive, and thus wanted free courses.

Apart from expectations, parents had thoughts on *approach to develop/ teach/ standardise STEM*:
- They would like STEM teaching to be integrated with core subjects, and not just focused on Coding/ Robotics, and focused more on STEM applications. STEM should replace obsolete subjects, such as home economics, accounting.
- One parent specified that in order to learn STEM, students also needed good English as materials were in or originated from English.
- Standardise STEM curriculum & grading system, also linked to other related curriculums
- The grades should be included in DSE/ university entry requirements.

Parents recognised the need for both *quality and quantity of STEM teachers:*
- Need more STEM teachers and provide more comprehensive training for them
- Parents were aware of the lack of STEM teachers or dedicated staff, and suggested to utilize online teaching/ courses during school hours to reduce the demand on manpower and time.

Role of Government in STEM development:
- Government should lead STEM education, i.e. provide STEM for all students at an early stage, make STEM interesting and hands-on, and thus to broaden students' horizons.
- Government to provide more resources on STEM education
- There should be more promotion on STEM and government to take a leading role.

STEM *competition*:
- Participation/ support in international competition to get a better understanding on STEM
- Participation in competition should not be solely based on student's academic achievement.
[Q15]

3.2   Educator Survey

3.2.1   Profile of Educator Respondents

STEM educators who responded to this survey comprised 56% teachers or curriculum leaders; 30% STEM teachers or instructors (teaching staff); 12% school principals or deputy school principals and 2% STEM instructors (non-teaching staff).

56%	30%	2%	12%

■ Teacher/ Curriculum leader   ■ STEM teacher/ instructor
■ STEM instructor (non-teaching staff) ■ School principal/ deputy
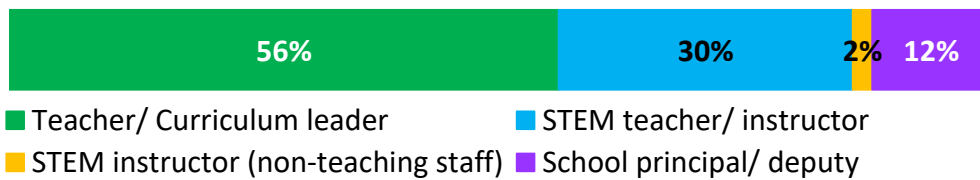
43% of these educators worked in primary schools and 57% at secondary schools. 76% worked in aided schools, 8% in direct subsidy scheme schools, 8% in government schools, 4% in private schools and 2% in international schools.

- Government school
- Aided school
- Direct subsidy scheme school
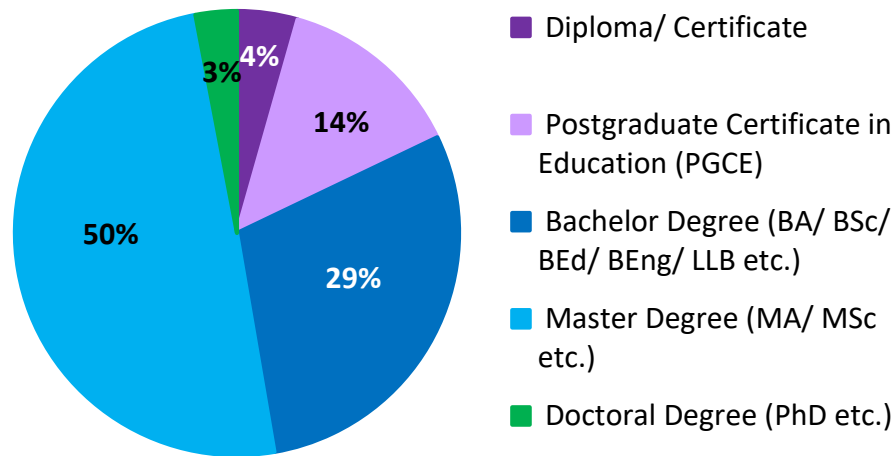- International school
- Private school
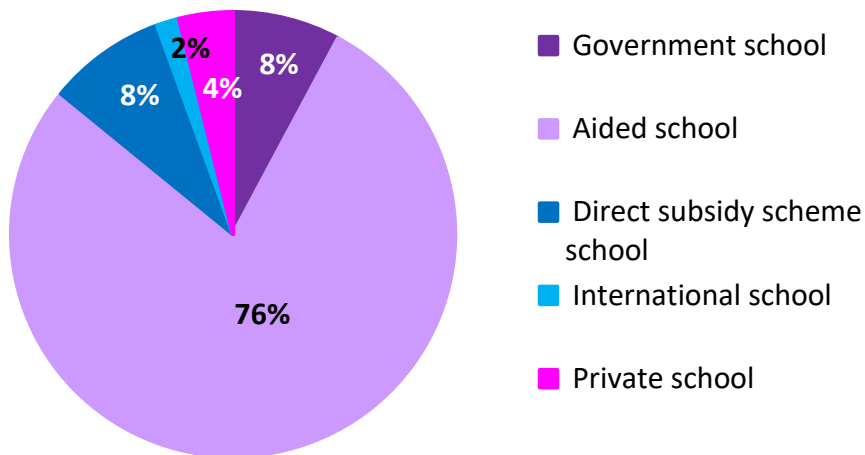
[S1/ S2/ S3]

These responded educators had similar proportions between the genders: 52% male and 48% female. Their age ranged from the twenties to the sixties with 70% of educators in the 31-50 age bracket: 22% aged 41-45; 21% aged 36-40; 14% aged 46-50 and 13% aged 31-35.
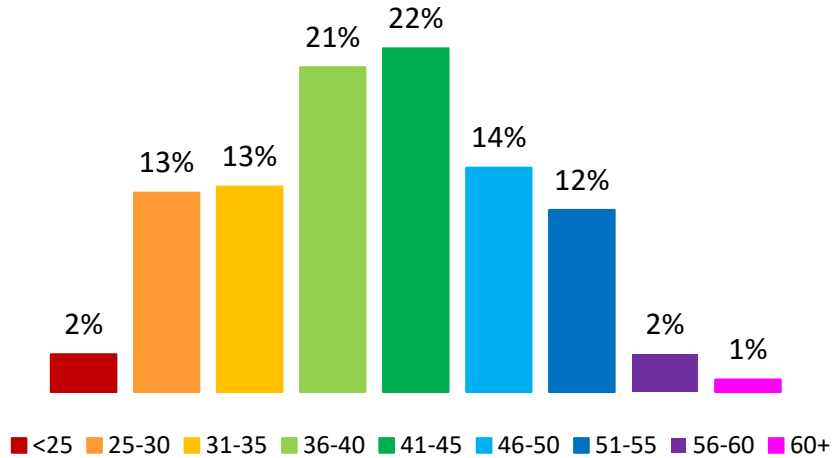
Educators were well-educated as 3% attained doctoral degrees, 50% with master's degrees, 29% with bachelor's degrees and 14% had Postgraduate Certificates in Education.

- Diploma/ Certificate
- Postgraduate Certificate in Education (PGCE)
- Bachelor Degree (BA/ BSc/ BEd/ BEng/ LLB etc.)
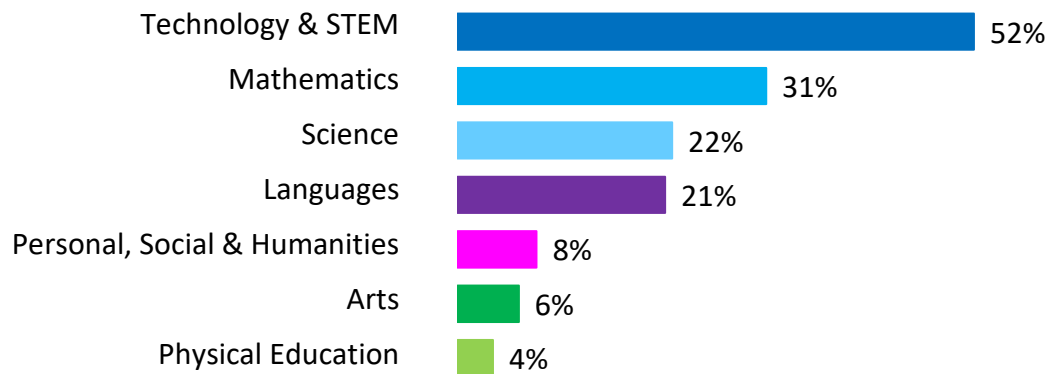- Master Degree (MA/ MSc etc.)
- Doctoral Degree (PhD etc.)

Responded educators studied a range of disciplines: 43% Education; 30% Computer Science & Mathematics; 15% Natural Sciences; 11% Languages & Humanities; 9% Engineering and 6% Business & Economics.

Discipline Studied	%
Architecture	2%

Business & Economics	6%
Computer Science & Mathematics	30%
Education	43%
Engineering	9%
Hospitality	1%
Languages & Humanities	11%
Law Studies	0%
Medicine	0%
Natural Sciences	15%
Philosophy & Religion	1%
Social Sciences	4%
Visual & Performing Arts	3%
Others	4%

As this survey targeted STEM educators, the subjects they taught were in line with their studies: 52% taught Technology & STEM; 31% Mathematics and 22% Science.

Technology & STEM — 52%
Mathematics — 31%
Science — 22%
Languages — 21%
Personal, Social & Humanities — 8%
Arts — 6%
Physical Education — 4%

[D1/D2/D3/D4/Q1]

3.2.2 Teaching and Training on STEM Education

STEM teachers had a variety of approaches to obtain their knowledge and training in STEM. 55% claimed they learned through *personal experience and e-learning*. 55% *attended courses organised by Education Bureau, Innovation, Technology and Industry Bureau or Hong Kong Productivity Council*. 42% *attended courses organised by teacher associations or NGOs*; 41% *attended internal training by the schools* and 33% *attended training provided by external STEM service providers*. 31% *studied STEM courses at universities or colleges*.

|	
Personal experience and e-learning	55%
Courses by EB, ITIB or HKPC	55%
Courses by teacher associations or NGO	42%
Attended internal training by the school	41%
Training by external STEM service providers	33%
Studied STEM courses at university or college	31%
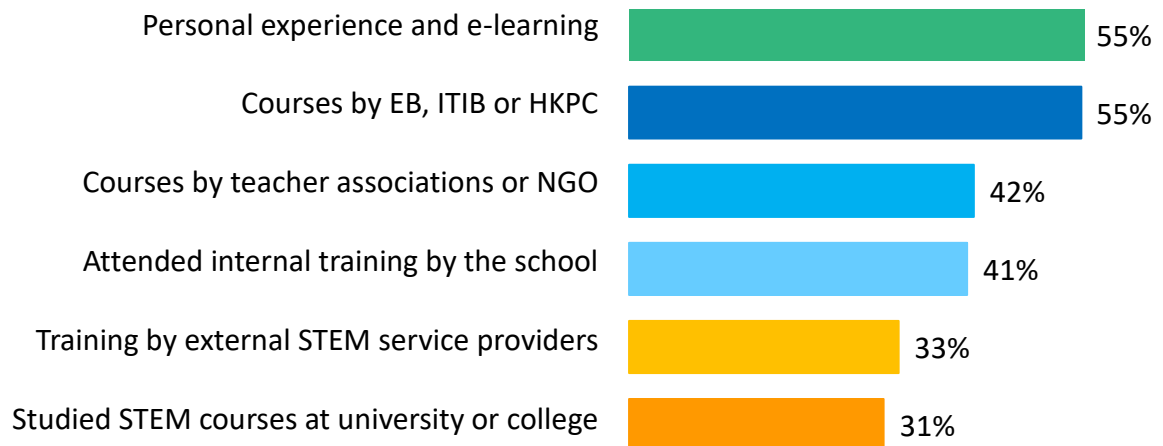
[Q2]

Some teachers were not experienced in teaching STEM: 40% had only taught STEM for 2 years or less. 22% taught STEM for 3 to 4 years, 18% for 5 to 6 years, 9% for 7 to 10 years and 11% for 11 years or more. Their average length of teaching STEM was 4.3 years.
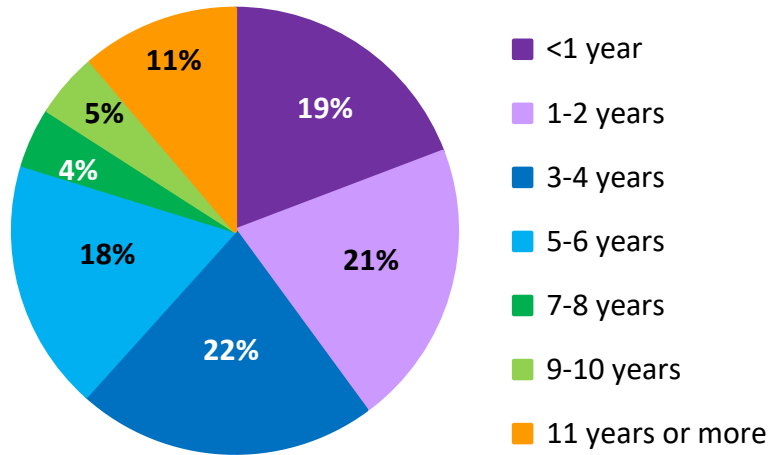
Thus, only 18% of teachers claimed that they had sufficient knowledge and experience to implement STEM. 52% said their experience was *just a bit,* while 30% said they did not have sufficient knowledge and experience to implement STEM.

| 18% | 52% | 30% |

■ Sufficient ■ Just a bit ■ Not sufficient
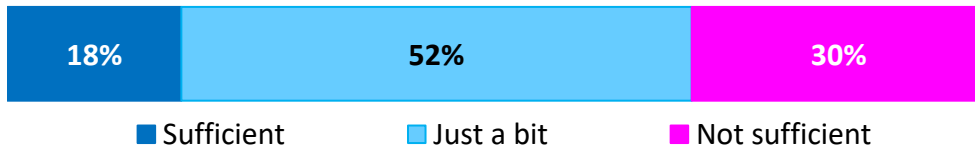
[Q3/Q4]

Teachers spent much of their time on non-teaching STEM-related activities such as sourcing, procurement, proposal application, class administration, etc. Overall, only 16% did not have to perform other non-teaching roles. 21% spent less than 10% of their time on non-teaching roles. However, 34% spent 20%-30%, 13% spent 40%-50%, and 15% spent more than 50% of their time on non-teaching roles. On average, they spent 25% of their time on non-teaching roles which was not the best use of their tight schedules.

| 16% | 21% | 34% | 13% | 15% |

■ Not at all ■ <10% ■ 20%-30% ■ 40%-50% ■ 50%+
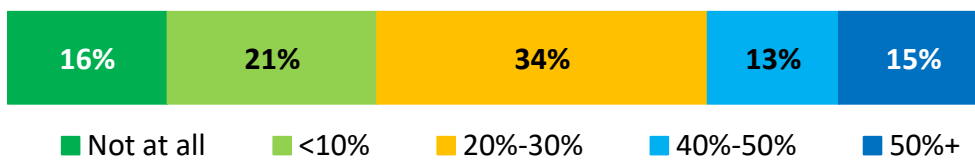
[Q5]

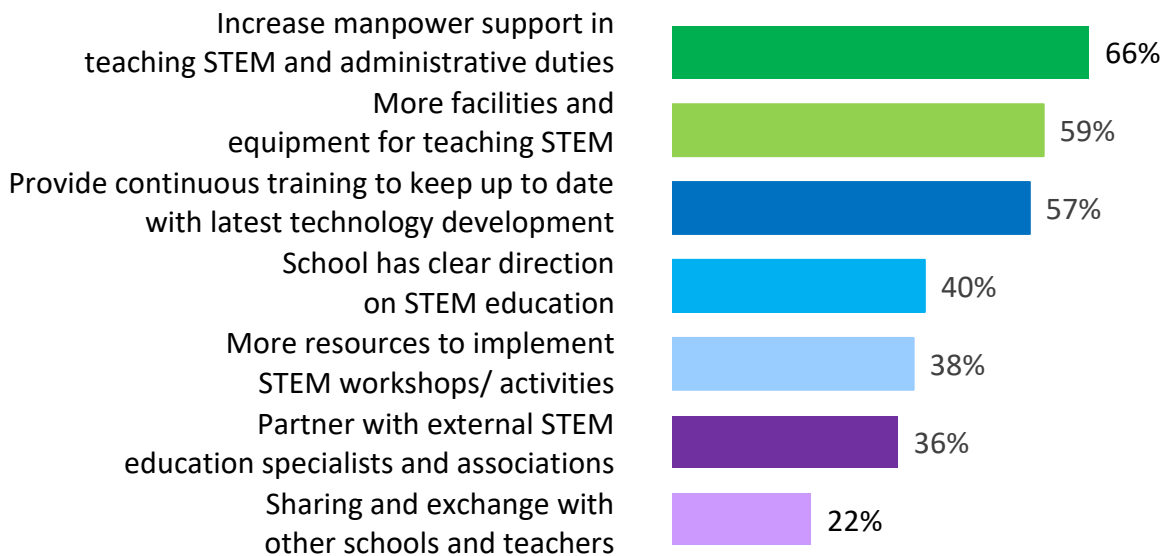35% claimed that their schools did not allocate sufficient resources to STEM. Only 17% said their schools had sufficient resources for STEM.

17%	45%	35%	3%

■ Sufficient　　■ Just a bit　　■ Not sufficient　　■ Not sure
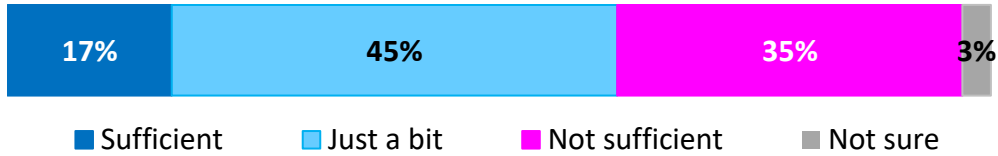
[Q6]

Thus 66% of the teachers thought the most important factor to support teaching STEM was to *increase manpower support in teaching STEM and administrative duties*. Two other important factors were *more facilities and equipment for teaching STEM* (59%) and *provide continuous training to keep up-to-date with the latest technology development* (57%). Other factors included *schools to have clear directions on STEM education* (40%); *more resources to implement STEM workshops/ activities* (38%); *partner with external STEM education specialists and associations* (36%) and *sharing and exchange with other schools and teachers* (22%).

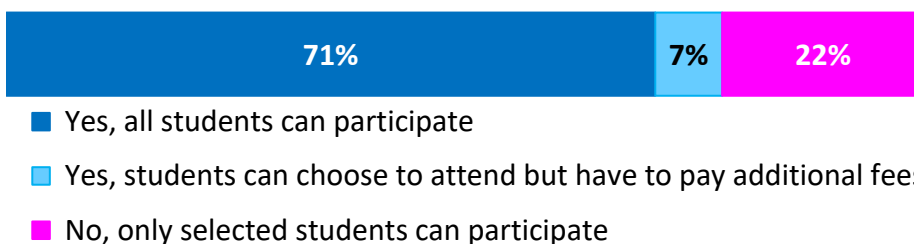|	
Increase manpower support in teaching STEM and administrative duties	66%
More facilities and equipment for teaching STEM	59%
Provide continuous training to keep up to date with latest technology development	57%
School has clear direction on STEM education	40%
More resources to implement STEM workshops/ activities	38%
Partner with external STEM education specialists and associations	36%
Sharing and exchange with other schools and teachers	22%

[Q7]

3.2.3　School Setting & Resources on STEM Education

For 54% of the schools of these educators, STEM was *integrated into science, technology or related subjects*. 48% *taught STEM as a regular ECA provided by the school resources*. 38% *needed to apply for funding and it was taught by external STEM education vendors as a non-regular ECA*. 36% of these schools had *STEM Labs for students and teachers to use* and 29% *taught STEM as part of the school curriculum by dedicated STEM teacher(s)*.

|	
It is integrated into science, technology or related subjects	54%
It is a regular ECA provided by school resources	48%
Need to apply for funding, it is taught by external STEM education vendors as a non-regular ECA	38%
There is a STEM Lab for students and teachers to use	36%
It is part of the school curriculum and is taught by dedicated STEM teacher(s)	29%
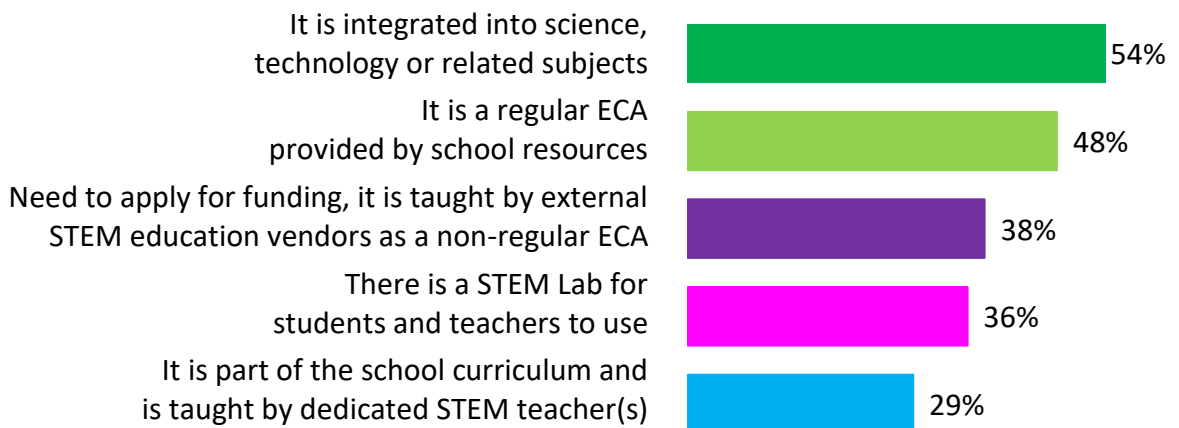
71% of educators said that *all students could participate in STEM*. Conversely, 22% said their schools would *select students to participate in STEM activities* and 7% said *students could choose to attend by paying additional fees*.

71%	7%	22%

- ■ Yes, all students can participate
- ■ Yes, students can choose to attend but have to pay additional fees
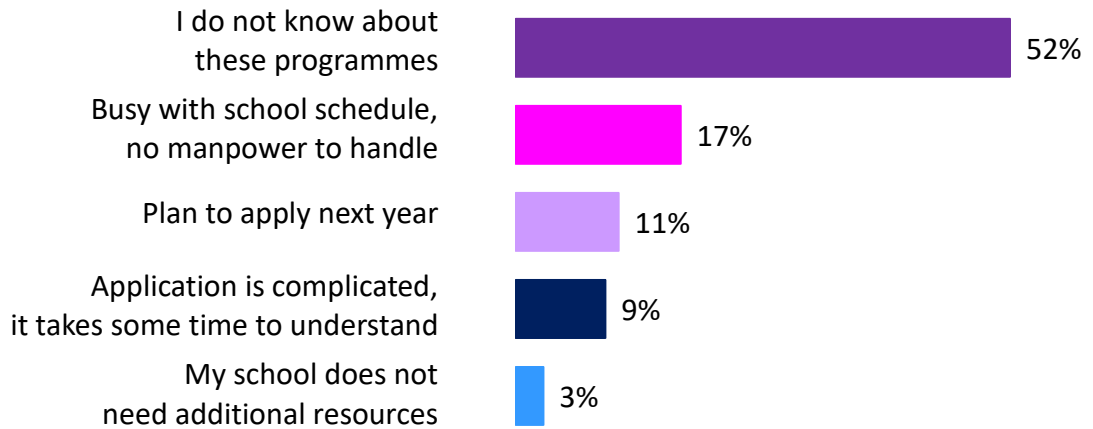- ■ No, only selected students can participate

[Q8/ Q9]

Regarding the application to IT Innovation Lab in Secondary Schools Programme or Knowing More About IT Programme, 56% of the schools have applied. Of those who have applied, 58% found it useful, 41% just fair and 1% not useful at all.

58%	41%	1%

■ It is very useful   ■ Just fair   ■ It is not useful
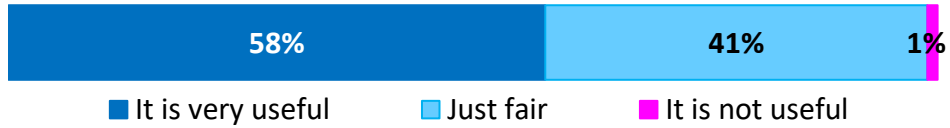
For the remaining 44% of schools that did not apply to those programmes, 52% were unaware of those programmes, and 17% were busy with school schedule and thus had no manpower to handle them. Actually, 11% planned to apply next year, while 9% found the application complicated.

I do not know about these programmes	52%
Busy with school schedule, no manpower to handle	17%
Plan to apply next year	11%
Application is complicated, it takes some time to understand	9%
My school does not need additional resources	3%

Of the schools that provided STEM as an ECA in the 2021/ 2022 academic year, 67% funded the activities with the school budget and 7% were self-funded by parents or school foundations. Other funding sources included IT Innovation Lab in Secondary Schools Programme or Knowing More About IT Programme (41%), Quality Education Fund (36%), Education Bureau (33%) and NGOs or other sources (9%).

From school budget	67%
IT Innovation Lab/ Knowing More About IT	41%
Quality Education Fund	36%
Education Bureau	33%
NGOs or other sources	9%
Self-funded by parents/ school foundations	7%
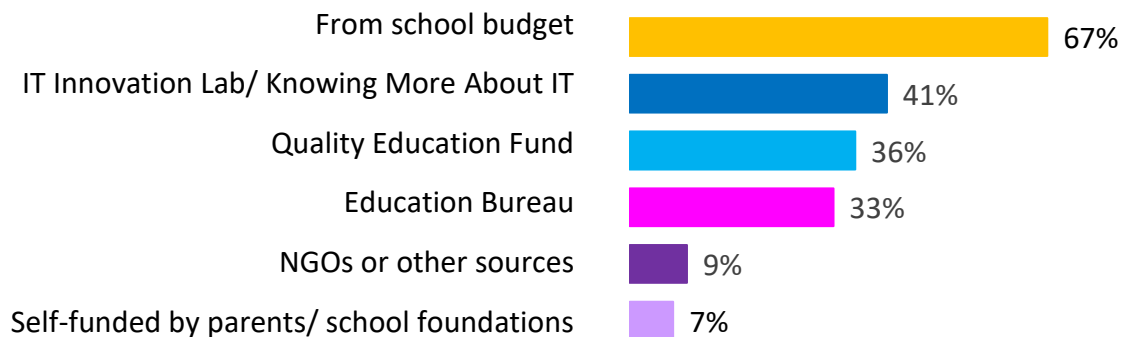
[Q10/ Q11]

Educators identified 5 main factors for developing STEM : *more dedicated STEM teachers/ assistants* (71%); *recurring and dedicated funds to implement STEM education* (54%); *subsidies for the schools to buy hardware/ software* (53%); *regular technology training for STEM teachers* (52%) and *additional STEM Instructors (non-teaching staff)* (50%).

Other factors included:

Adopt an approach that focuses on the needs of the students or standardized teaching curriculum for STEM education	43%
Organize more STEM activities & allow more opportunities for students to join STEM competitions locally or internationally	42%
Install smart facilities in school to encourage students' interest and for students to experience technology applications	40%
Support from technology companies such as arrange seminars and company visits for students	32%
Adopt an internationally recognized standards for STEM education	29%
Strengthen the communication with parents to ensure that they understand the importance of STEM education, and thus support students to participate in activities outside school hours	21%

[Q12]

3.2.4 TechEd & Future Skills

Top 5 emerging technology/ future skills from perspectives of educators were:
1. AI/ Machine Learning   80%
2. Cyber Security   54%
3. Data Analytics   54%
4. Cloud Computing   42%
5. Robotics Engineering   40%

Other future skills included Green Technology & Sustainability (38%), Multi-media Design (37%); Virtual Reality/ Augmented Reality (36%); Leadership & Entrepreneurship (31%); Game and Video Production (23%); Storytelling/ Presentation Skills (22%); Non-fungible token/ Block Chain (20%); Fintech/ Financial Knowledge (18%) and Aerospace Technology (13%).
[Q13]

81% of the educators thought students should start STEM education from primary school: 36% from Primary 1-3; 45% from Primary 4-6 and 16% from Secondary 1-3.
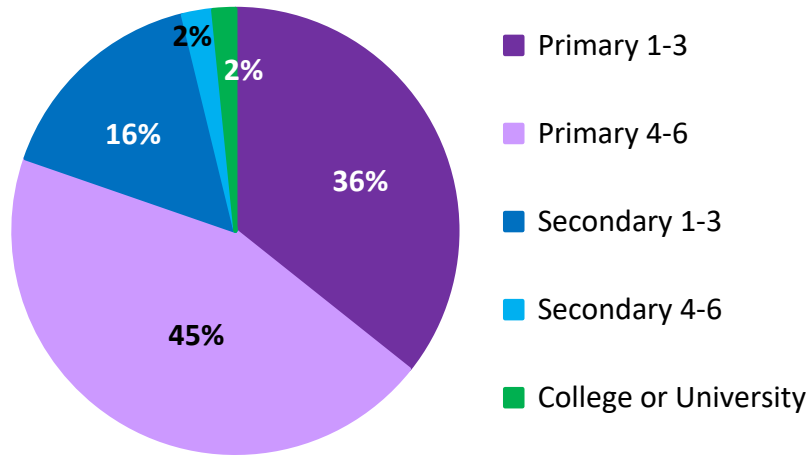
[Q14]

3.2.5 Other Opinions on STEM Technology Education from Educator

This section summarised the highlights of the opinions. Verbatims are available in Appendix 6b.

Educators expressed their opinions on *approach to develop or teach STEM*:
- STEM education should be comprehensive
- More collaborative works between STEM-related subjects or languages
- A need for dedicated staff
- It should be implemented based on students' abilities or interests and not as a subject or an interest class
- Require both hardware & software

Educators wanted more STEM *resources*:
- Not sufficient resources - more regular teaching staff, general funding and hardware are required
- Formalise funding into regular grants or schemes

Formalise curriculum & provide standards:
- Standardise the syllabus like other subjects, the syllabus should align with the changing time

2022 Online Survey on STEM Education SURVEY REPORT

- Become part of school curriculum & examination

Teachers would like to have more *training:*
- More training & support (although teachers' time are already tight)
- Bring training to school instead of attending courses outside school
- Training on how to integrate STEM into other subjects

Teacher would like to have more *promotion* on STEM, not just within the government and schools but also in commercial fields.

Lastly, educators would like to see more *career opportunities* originate from STEM as they found currently STEM was not that helpful for further studies.
[Q15]

Part 4   Summary & Conclusion

4.1   Summary of Parent Survey

Children of responded parents were mainly at their primary school stage. 56% studied in aided schools and 22% studied in government schools. It seemed that parents of primary school children were more interested to participate in this STEM related survey.

51% thought that STEM was *a subject to learn new technologies*, 34% thought it was *a subject of general studies, science, mathematics in the regular school curriculum.* Parents had a mixed concept on what STEM was and this possibly reflected how STEM was taught or implemented in their children's schools.

When selecting STEM courses, all criteria seemed to be important but the key driver was the actual *content to learn. Quality, reputation and experience of teacher/ STEM service providers* and *locations & facilities* of the service providers were less important.

Among the top three most popular STEM programmes that students have enrolled, Coding/ Computer Programming (59%) was by far the most popular, followed by AI/ Robotics (35%) and Electronic or Online Games/ eSports (27%), suggesting these areas were what parents thought to be most useful, practical and possibly fun for children to attend.

STEM was not for everyone yet. 53% of parents said their children was participating in STEM activities either at school or outside school. Also, STEM education was not available for all students as only 64% of parents knew that STEM education was offered in their children's schools.

There were different approaches to how STEM was taught in these schools: 40% said that STEM was *integrated into science, technology, mathematics or related subjects* while 39% said STEM was *an extra-curriculum activity for students*.

Only 10% felt there were sufficient STEM resources and support at school. This was reflected in the factors that parents thought would help implement STEM education effectively: *more funding and resources for schools to develop school-based STEM curriculum* (29%) and *employ more STEM teacher or additional STEM instructor to coordinate extra curriculum programme/ activity* (29%).

In addition, the top factors to help implement STEM education effectively were *set up more "Smarter Campus" facilities and equipment to enable students with more access to technology* (58%); *provide a variety of STEM workshops or activities for parents and students to keep up to date with the latest technology and talent development in respective technology fields* (57%); *STEM education should be a compulsory subject with more teaching assistance* (44%) and *align with teaching materials, apply STEM or technology education to all subjects when designing the school curriculum* (42%).

The top five emerging technology/ future skills according to parents were: AI/ Machine Learning (75%); Data Analytics (51%); Cyber Security (50%); Green Technology & Sustainability (39%) and Multi-media Design (38%).

86% thought STEM should start at primary school as majority of the children of these parents were attending primary school. Also, 79% agreed that STEM should be a formal school curriculum.

Parents also provided other opinions on STEM. They reflected some key areas on STEM development and expectations:

- Parents were confused about what STEM meant but still thought STEM was important.
- High expectations on STEM, including to roll out STEM programme for students as early as possible, attend workshops with their children, free courses on STEM as current ones were relatively expensive.
- They would like STEM education to be integrated with major subjects, and not just focused on Coding/ Robotics. This meant students needed to be good in English to learn STEM well.
- Standardise STEM curriculum and grading system, linked to other related curriculum or included as DSE/ university entry requirement.
- Parents recognised the importance of STEM and thus supported the need for more qualified and dedicated STEM teachers and more training for teachers.
- Government should lead STEM education, provide more resources on STEM education and with better promotion.

4.2 Summary of Educator Survey

Among the STEM educators who responded to the survey, 43% worked in primary schools and 57% in secondary schools. 76% worked in aided schools. Of all responded educators, 56% were regular teachers/curriculum leaders and 30% were STEM teaching staff.

82% of the educators were university graduates. 30% have studied Computer Science & Mathematics. Among these STEM educators (taught/ led/ involved in STEM), 52% taught Technology & STEM, 31% taught Mathematics and 22% taught Science subjects.

55% of STEM teachers obtained their knowledge and training in STEM via *personal experience and e-learning*. Others learned via *courses organized by EB, ITIB, HKPC, teacher* associations *or NGOs*, *internal training arranged by schools* and *external STEM service providers*. Only 31% studied *STEM courses at university or college*.

Some STEM teachers were not that experienced as 40% had taught STEM for 2 years or less. Only 18% claimed they had sufficient knowledge and experience to implement STEM. 84% of STEM teachers needed to spend time on non-teaching roles. On average, they spent 25% of their time on non-teaching roles which was not the best use of their time. STEM teachers needed more training and administrative support.

Resources allocated to STEM was not enough as 35% claimed that to be insufficient. Thus 66% of STEM teachers thought the most important factor to support teaching STEM was to *increase manpower support in teaching STEM and administrative duties*, followed by *more facilities and equipment for teaching STEM* (59%) and *provide continuous training to keep up-to-date with latest technology development* (57%).

54% of the schools have *integrated STEM into science, technology or related subjects*, while 48% *taught STEM as a regular ECA provided by the school resources*. However, 29% of the responded teachers said STEM activities were not for all students, their students either needed to pay additional fees for STEM or selected by the school to participate.

56% have applied for IT Innovation Lab in Secondary School or Knowing More about IT programmes. For those who did not apply, 52% were not aware of the programmes, 17% were busy with school schedule, while 11% planned to apply in the following year.

To provide for STEM as ECA in 2021-2022 academic year, 67% got funding from school budget, 41% from IT Innovation Lab in Secondary Schools Programme or Knowing More About IT Programme, 36% from Quality Education Fund and 33% from Education Bureau.

To educators, the top five factors to develop STEM were *dedicated STEM manpower* (71%), *recurring and dedicated funds* (54%), *subsidies to buy hardware/ software* (53%), *regular technology training for STEM teachers* (52%) and *additional STEM Instructor (non-teaching staff)* (50%).

The top five emerging technology/ future skills from perspectives of educators were AI/ Machine Learning (80%); Cyber Security (54%); Data Analytics (54%); Cloud Computing (42%) & Robotics Engineering (40%). These were somewhat similar to the ranking and percentages by parents which were AI/ Machine Learning (75%); Data Analytics (51%); Cyber Security (50%); Cloud Computing (32%) & Robotics Engineering (32%).

Also similar to parents' views (86%), 81% of educators believed that STEM education should start from primary school.

Educators also commented on their views on STEM, including:
- Approach to develop or teach STEM - comprehensive STEM education, STEM education to work with other subjects, dedicated staff, learn STEM according to students' abilities and interests
- Regarding STEM resources - more regular teaching staff, hardware, formalise funding into regular grant/ scheme
- Formalise curriculum & standardise syllabus like other subjects and the syllabus needs to align with changing time
- Teachers would like more continuous training
- Educators would like to see promotion on STEM not just in government and schools, but also in commercial fields
- They would like to see more career and opportunities generated from STEM education.

Appendix 1: English Questionnaire for Parent

Introduction:
Thank you for participating in this survey about STEM education in Hong Kong. Your suggestions and views will help promote the TechEd development in Hong Kong.

The online survey will take about 10 minutes. All answers will only be used for analysis and no personal data will be collected. Apart from answering the questions, you are welcome to provide your opinion at the end of the survey.

The definition of STEM education in this survey is training and education related to technology such as Coding/ Programming, AI, IoT, Data Analytics, Robotics, Drones, eSports, Mechanics & Engineering, AR/ VR, Aviation, Aerospace, etc.

Please choose the language for the survey
請選擇問卷的語言

-        Chinese 中文

-        English 英文

Screening Question
S1.   Is your child (or one of your children) currently attending a primary or secondary school in Hong Kong? (SA)
-        Yes
-        No **[Disqualified & Skip to E1]**

Main Questionnaire
If you have more than one child, please answer the following questions from the perspective of one of your children.

Q1.   How old is your child? (SA)
-        6 to 9 years old (junior primary school)
-        10 to 12 years old (senior primary school)
-        13 to 15 years old (junior secondary school)
-        16 to 18 years old (senior secondary school)

Q2. What type of school is your child attending? (SA)
- Government school
- Aided school
- Direct subsidy scheme school
- International school
- Private school
- Other

Q3. Which of the following best describes your definition of "STEM education" ? (SA)
- A subject to learn new technologies
- A subject of General Studies, Science, Mathematics in the regular school curriculum
- It is an extra-curricular activity provided by the school
- None of the above. I think STEM education is (please specify) _____

_____

Q4. Is your child attending the following extra-curricular activities organized by the school? (MA)
- Sports
- Arts and Craft/ Design
- Music and Performing arts
- Foreign Languages
- STEM
- Others

Q5. Is your child currently enrolled in any STEM activity? (SA)
- Yes, at school and outside school
- Yes, only outside school
- Yes, only at school (Skip to Q7)
- No (Skip to Q8)

Q6a. When selecting STEM activity for your child, how important is "Costs" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6b. When selecting STEM activity for your child, how important is "Location & Facilities" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6c. When selecting STEM activity for your child, how important is "Schedule & Lessons per week" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6d. When selecting STEM activity for your child, how important is "Learning content" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6e. When selecting STEM activity for your child, how important is "Quality, reputation & experience of teacher/ STEM service provider" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6f. When selecting STEM activity for your child, how important is "Certification & qualification upon completion" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q6g. When selecting STEM activity for your child, how important is "Align with school curriculum" of the activity? (SA)
- Extremely important
- Fairly important
- Neutral
- Not that important
- Not important at all

Q7. Which type(s) of STEM programme have your child enrolled? (MA)
- Coding/ Computer Programming
- AI, Robotics
- Drones
- Electronic or Online Games/ eSports
- Mechanical Design & Engineering
- AR/ VR
- Aerospace technology
- Others, please specify: _____

Q8. Is STEM being offered in your child's school? (SA)
- Yes
- No (Skip to Q10)

Q9. How is STEM being taught at your child's school? (MA)
- It is part of the school curriculum and is taught by dedicated STEM teacher(s)
- It is integrated into science, technology, mathematics or related subjects
- It is an extra-curricular activity for students to participate
- A dedicated STEM teacher will teach or lead STEM projects/ activities
- An external instructor teaches or leads STEM projects/ activities in the school and students may have to pay additional fees
- An external service provider teaches or leads STEM projects/ activities funded by the school
- None of the above, please specify: _____

Q10. Do you think there is sufficient resources and support dedicated to STEM education in your child's school? (SA)
- Sufficient
- Just fair
- Not sufficient
- Not sure

Q11. What do you think are the key factors that will help implement STEM education in school effectively? Please choose your top 3 factors. (MA, only allow to choose 3)
- STEM education should be a compulsory subject with more teaching assistance
- School should set up more "Smarter Campus" facilities and equipment to enable students with more access to technology
- Provide a variety of STEM workshops or activities for parents and students to keep up to date with the latest technology and talent development in respective technology fields
- Align with teaching materials, apply STEM or technology education to all subjects when designing the school curriculum
- More funding and resources for schools to develop school-based STEM curriculum
- Engage technology companies to provide seminars and company visits for students
- Employ more STEM teacher or additional STEM instructor to coordinate extra-curriculum programme/ activity
- Provide STEM workshops/ activities for parents and students together
-
- Other suggestions, please specify: _____

Q12. Which of the following emerging technology or future skills will become essential for your child to prepare for his/her future? Please choose maximum 5. (MA, only allow to choose 5)
- Aerospace technology
- Artificial Intelligence/ Machine Learning
- Cloud Computing
- Cyber Security
- Data Analytics
- Fintech/ Financial knowledge
- Game and Video Production
- Green Technology & Sustainability
- Leadership & Entrepreneurship
- Multi-media Design (illustration design, video editing etc.)
- NFT (Non-fungible token)/ Block Chain
- Robotics Engineering
- Storytelling/ Presentation Skills
- Virtual Reality (VR)/ Augmented Reality (AR)
- Others, please specify: _____

Q13. In your opinion, when should your child start to learn STEM? (SA)
- Primary 1-3
- Primary 4-6

- Secondary 1-3
- Secondary 4-6
- College or University

Q14. Do you agree that STEM should become a formal school curriculum? (SA)
- Totally agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Totally disagree

Q14b. Will you encourage your child to study STEM related disciplines as the major in his/ her tertiary education? (SA)
- Strongly encourage
- Encourage because my child is already learning STEM
- Encourage although my child is not that familiar with STEM
- Neither encourage nor discourage
- Will not encourage at all

Q15. Please provide other opinions on STEM/ technology education. [Optional]

_____

_____

Demographics
D1. What is your gender? (SA) [Optional]
- Male
- Female

D2. How old are you? (SA) [Optional]
- <25
- 25-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 60+

D3.   Your education level is… (SA)
-    Primary school
-    Secondary school
-    Pre-college/ university or similar
-    Bachelor Degree
-    Master Degree
-    PhD

D4.   Thank you for your interest in STEM education. Would you like to receive STEM related information from HKPC in the future?
-        No (end the survey)
-        Yes, please provide email address (optional) _____

E1.   Thank you for your interest in STEM education. Would you like to receive STEM related information from HKPC in the future?
-        No (end the survey)
-        Yes, please provide email address (optional) _____

Appendix 2: Chinese Questionnaire for Parent

全港家長教師 STEM 網上問卷調查 2022

介紹：

感謝你抽空參與這項有關香港 STEM 教育的調查，你的建議及方案將有助我們推動創科教育。

這份問卷調查大約需要 10 分鐘完成。所有答案只用作總匯分析和報告，並不會收集任何個人資料。除回答問題外，歡迎你在問卷最後部分提供其他相關意見。

問卷調查中 STEM 教育定義為與編程、人工智能、物聯網、數據分析、機械人、無人機、電子競技、機械人工程、AR/VR、航空、航天等相關科技與技術的培訓和教育。

Please choose the language for the survey

請選擇問卷的語言

- Chinese 中文
- English 英文

籬選問題

S1.　　你的子女現時是否就讀於香港的小學或中學? (SA)

- 是
- 否 [Disqualified & Skip to E1]

主要問卷

如果你有多過一名子女，請就其中一名子女的情況回答以下問題：

Q1.　　你子女的年齡是 ... (SA)

- 6-9 歲 (小學低年級)
- 10-12 歲 (小學高年級)
- 13-15 歲 (初中)
- 16-18 歲 (高中)

Q2.   你的子女就讀於什麼學校? (SA)

- 官立學校

- 資助學校

- 直資學校

- 國際學校

- 私立學校

- 其他

Q3.   以下哪一句子最能代表你對「STEM 教育」的定義? (SA)

- 這是一個學習新科技的科目

- 這是學校常規課程內常識/ 科學/ 數理科的學習內容

- 這是一項學校的課外活動

- 以上都不是。我認為 STEM 教育是 (請說明) _____

_____

Q4.   你的子女有否參加以下由學校安排的課外活動? (MA)

- 運動

- 美術與工藝/設計

- 音樂及表演藝術

- 外語

- STEM

- 其他

Q5.   你的子女有否參加任何與 STEM 相關的活動? (SA)

- 有，參與校內和校外活動

- 有，只參與校外活動

- 有，只參與校內活動 (Skip to Q7)

- 沒有 (Skip to Q8)

Q6a.   當你為孩子選擇 STEM 活動時，活動的「費用」會有多重要？ (SA)

- 極其重要

- 幾重要
- 中立
- 不算重要
- 根本不重要

Q6b. 當你為孩子選擇 STEM 活動時，活動的「地點和設施」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要
- 根本不重要

Q6c. 當你為孩子選擇 STEM 活動時，活動的「課程時數及每週節數」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要
- 根本不重要

Q6d. 當你為孩子選擇 STEM 活動時，活動的「學習內容」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要
- 根本不重要

Q6e. 當你為孩子選擇 STEM 活動時，活動的「教師/ STEM 服務商的聲譽、質素和教學經驗」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要

- 根本不重要

Q6f.　當你為孩子選擇 STEM 活動時，活動的「課程獲得的認證和資格」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要
- 根本不重要

Q6g.　當你為孩子選擇 STEM 活動時，活動的「內容能否配合學校課程」會有多重要？ (SA)
- 極其重要
- 幾重要
- 中立
- 不算重要
- 根本不重要

Q7.　你的子女曾參加以下哪些 STEM 課程? (MA)
- 編碼/ 電腦程式
- 人工智能及機械人
- 無人機
- 電子或網上遊戲/ 電競
- 機械設計與工程
- 虛擬現實 (VR)/ 擴張現實 (AR)
- 航空航天技術
- 其他，請註明 : _____

Q8.　你子女的學校有否提供 STEM 的課程? (SA)
- 有
- 沒有 (Skip to Q10)

Q9.　你子女的學校是採用以下哪些模式教授 STEM 課程? (MA)
- STEM 課程是一個必修科目，由專責老師教授

- STEM 內容包含在綜合科學、科技、數學或相關學科內
- 是作為課外活動，學生可報名參加
- 有專責老師教授或領導 STEM 項目/活動
- 學校聘請校外講師教授或領導 STEM 項目/活動，學生需要支付額外費用
- 學校聘請校外機構教授或領導 STEM 項目/活動，費用由學校資助
- 以上都不是，請註明 : _____

Q10. 你認為你的子女在學校接受的 STEM 教育的資源和支援是否足夠? (SA)
- 足夠
- 一般
- 不足夠
- 不了解

Q11. 你認為以下哪些是有助學校發展 STEM 創科教育的方法？請選擇最有效的 3 個。(MA, only allow to choose 3)
- 學校應將 STEM 教育列為必修科目，增加更多教學支援
- 學校應提供更多智能設施和設備，讓學生有更多機會接觸科技
- 提供多元化的 STEM 工作坊/活動，讓家長和學生更了解最新科技和各項科技領域的人才發展
- 配合學校教材，設計課程時將 STEM 或科創教育應用於學習所有科目內
- 學校應投放更多資金和資源發展校本 STEM 課程
- 與科技公司合作，為學生提供職業講座和參觀科技公司
- 聘請多位 STEM 教師/ 增設 STEM 教育統籌專員來統籌學校的課程/ 活動
- 與家長配合，提供親子 STEM 或科創教育工作坊及活動
- 其他，請註明 : _____

Q12. 你認為以下哪些是你子女為裝備未來不可缺少的技能? 請選擇最多 5 個技能。(MA, only allow to choose 5)
- 航空航天技術
- 人工智能/ 機器學習
- 雲端運算
- 網絡安全

- 數據分析
- 金融科技/ 金融知識
- 遊戲和視頻製作
- 綠色科技及持續性
- 領導力與企業家精神
- 多媒體設計（插畫設計、影片剪輯等）
- NFT (Non-fungible token)/ 區塊鏈
- 機械人工程
- 講故事/ 演講技巧
- 虛擬現實 (VR)/ 擴張現實 (AR)
- 其他，請註明 : _____

Q13. 你認為子女應該在什麼時候開始學習 STEM/ 創科教育? (SA)
- 小一至小三
- 小四至小六
- 中一至中三
- 中四至中六
- 大專或大學以上

Q14. 你同意將 STEM/ 創科教育列為學校的正規課程嗎? (SA)
- 非常同意
- 同意
- 中立
- 不同意
- 非常不同意

Q14b. 你會鼓勵你的孩子在大專或大學修讀 STEM 相關的學科為主修科嗎？(SA)
- 非常支持
- 支持，因為我的孩子已經在學習 STEM
- 支持，但我的孩子仍未學習/ 熟悉 STEM
- 不特別支持或不支持

- 不會支持

Q15.　　你對 STEM/創科教育和未來技能的其他意見: [Optional]

_____

_____

背景資料

D1.　　你的性別是? (SA) [Optional]

- 男

- 女

D2.　　你的年齡是? (SA) [Optional]

- <25
- 25-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 60+

D3.　　你的教育程度是... (SA)

- 小學

- 中學

- 高等教育或同等學歷

- 大學

- 碩士

- 博士

D4.　　感謝你對 STEM 教育的興趣。你想收到由生產力局發放的 STEM 資訊嗎？

- 不想 (end the survey)

- 想, 請提供電子郵件 (optional) _____

E1.　　感謝你對 STEM 教育的興趣。你想收到由生產力局發放的 STEM 資訊嗎？

- 　不想 (end the survey)
- 　想, 請提供電子郵件 (optional) _____

-完-

Appendix 3: English Questionnaire for Educator

Online Survey - Nurturing Our Home-grown STEM Talent 2022

Introduction:
Thank you for participating in this survey about STEM education in Hong Kong. Your suggestions and views will help promote the TechEd development in Hong Kong.

The online survey will take about 10 minutes. All answers will only be used for analysis and no personal data will be collected. Apart from answering the questions, you are welcome to provide your opinion at the end of the survey.

The definition of STEM education in this survey is training and education related to technology such as Coding/ Programming, AI, IoT, Data Analytics, Robotics, Drones, eSports, Mechanics & Engineering, AR/ VR, Aviation, Aerospace, etc.

Please choose the language for the survey
請選擇問卷的語言

- Chinese 中文
- English 英文

Screening Questions
S1.   Do you work in a ...... (SA)
   - Primary School
   - Secondary School

S2.   Which category does your school belong to? (SA)
   - Government school
   - Aided school
   - Direct subsidy scheme school
   - International school
   - Private school
   - Others

S3.   What is your role in the school you are working in? (SA)
- Teacher/ Curriculum leader
- STEM teacher/ STEM Instructor (teaching staff)
- STEM Instructor (non-teaching staff)
- School principal/ Deputy principal [Skip to Part II]

Part I: Teaching & Training on STEM Education

Q1.   What subjects are you teaching at school? (MA)
- Arts
- Languages (English, Chinese, Others)
- Mathematics
- Personal, Social and Humanities
- Physical Education
- Science
- Technology & STEM, please specify areas : _____
- Others, please specify : _____

Q2.   How did you obtain your knowledge and training in STEM/ technology education (TechEd)? (MA)
- Studied STEM courses at university or college
- Attended courses organized by Education Bureau, Innovation, Technology and Industry Bureau or Hong Kong Productivity Council
- Attended courses organized by teacher associations or NGO
- Attended training provided by external STEM service providers
- Attended internal training by the school
- Personal experience and e-learning
- Others, please specify : _____

Q3.   How long have you taught/led /been involved in STEM/ technology education (TechEd)? (SA)
- <1 year
- 1-2 years
- 3-4 years
- 5-6 years
- 7-8 years
- 9-10 years
- 11 years or more

Q4.   Do you think you have sufficient knowledge and experience to implement STEM/ technology education (TechEd) in your school? (SA)
-       Sufficient
-       Just a bit
-       Not sufficient

Q5.   Apart from teaching, are you also responsible for tasks associated with STEM activities, e.g. sourcing, procurement, proposal application, class administration or other related duties? If yes, how much time do you spend on those tasks? (SA)
-       Not at all
-       Less than 10%
-       Around 20% to 30%
-       Approximate 40% to 50%
-       More than 50%

Q6.   Do you think your school has sufficient resources allocated to STEM/ technology education (TechEd)? (SA)
-       Sufficient
-       Just fair
-       Not sufficient
-       Not sure

Q7.   Which of the following are the 3 most important factors that can support you in teaching STEM/ technology education (TechEd) at your school? (MA, only allow to choose 3)
-       Increase manpower support in teaching STEM and administrative duties
-       More facilities and equipment for teaching STEM
-       Provide continuous training to keep up to date with latest technology development
-       More resources to implement STEM workshops/ activities
-       School has clear direction on STEM education
-       Sharing and exchange with other schools and teachers
-       Partner with external STEM education specialists and associations
-       Others, please specify : _____

Part II: School Setting and Resources on STEM Education

Q8.   How is STEM/ technology education (TechEd) being taught in your school? (MA)
-       It is part of the school curriculum and is taught by dedicated STEM teacher(s)

- It is integrated into science, technology or related subjects
- There is a STEM Lab for students and teachers to use
- It is a regular ECA provided by the school resources
- Need to apply for funding, it is taught by external STEM education vendors as a non-regular ECA
- None of the above, please specify : _____

Q9. Generally speaking, is STEM/ technology education (TechEd) available to all students in your school? (SA)
- Yes, all students can participate
- Yes, students can choose to attend but have to pay additional fees
- No, only selected students can participate

Q10. Has your school applied for the "IT Innovation Lab in Secondary Schools" Programme or the "Knowing More About IT" Programme? Do you think the programme is useful in enhancing STEM education in school? (SA)
Yes, my school has applied:
- It is very useful
- Just fair
- It is not useful, my reason(s) : _____
No, my school has not applied because:
- I do not know about these programmes
- My school does not need additional resources
- Busy with school schedule, no manpower to handle
- Application is complicated, it takes some time to understand
- Plan to apply next year
- Other reasons, please specify : _____

Q11. Did your school organize any STEM related ECA in the 2021/22 school year and how was it funded? (MA)
- From school budget
- "IT Innovation Lab in Secondary Schools" Programme/ "Knowing More About IT" Programme
- Education Bureau
- Quality Education Fund
- Self-funded by parents/ school foundations
- NGOs or other sources
- There was no STEM related ECA during this school year

Q12. Which of the following are the key factors to the development of STEM/ technology education (TechEd) at school? Please choose your top 5 factors. (MA, only allow to choose 5)
- More dedicated STEM teacher/ assistant
- Additional STEM Instructor (non-teaching staff)
- Adopt an approach that focuses on the needs of the students or standardized teaching curriculum for STEM education
- Adopt an internationally recognized standards for STEM education
- Recurring and dedicated funds to implement STEM education
- Subsidies for the school to buy hardware/ software
- Regular technology training for STEM teachers
- Install smart facilities in school to encourage students' interest and for students to experience technology applications
- Support from technology companies such as arrange seminars and company visits for students
- Organize more STEM activities and allow more opportunities for students to join STEM competitions both locally or internationally
- Strengthen the communication with parents to ensure that they understand the importance of STEM education, and thus support students to participate in activities outside school hours

Part III. TechEd (Technology & Technical Education) & Future Skills

Q13. Which of the following technologies are essential for students to prepare for the future? Please choose maximum of 5. (MA, only allow to choose 5)
- Aerospace technology
- Artificial Intelligence/ Machine Learning
- Cloud Computing
- Cyber Security
- Data Analytics
- Fintech/ Financial Knowledge
- Game and Video Production
- Green technology & sustainability
- Leadership & Entrepreneurship
- Multimedia Design (illustration design, video editing etc.)
- NFT (Non-fungible token)/ Block Chain
- Robotics Engineering
- Storytelling/ Presentation skills
- Virtual Reality (VR)/ Augmented Reality (AR)

- Others, please specify: _____

Q14.   In your opinion, at what school level should students start to learn STEM? (SA)
- Primary 1–3
- Primary 4–6
- Secondary 1–3
- Secondary 4–6
- College or University

Q15.   Please provide other opinion on STEM/ technology education (TechEd) [Optional]

_____

_____

Demographics

D1.   What is your gender? (SA) [Optional]
- Male
- Female

D2.   How old are you? (SA) [Optional]
- <25
- 25-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 60+

D3.   What is the highest level of study you have achieved? (SA) [Optional]
- Diploma/ Certificate
- Postgraduate Certificate in Education (PGCE)
- Bachelor Degree (BA/ BSc/ BEd/ BEng/ LLB etc.)
- Master Degree (MA/ MSc etc.)
- Doctoral Degree (PhD etc.)

D4.   What did you major in your study? (MA) [Optional]

Architecture

Business & Economics
Computer Science & Mathematics
Education
Engineering
Hospitality
Languages & Humanities
Law Studies
Medicine
Natural Sciences
Philosophy & Religion
Social Sciences
Visual & Performing Arts
Others, please specify :

D5.   Thank you for your interest in STEM education. Would you like to receive STEM related information from HKPC in the future?
-          No (end the survey)
-          Yes, please provide email address (optional) _____

Appendix 4: Chinese Questionnaire for Educator

全港家長教師 STEM 網上問卷調查 2022

介紹：
感謝你抽空參與這項有關香港 STEM 教育的調查，你的建議及方案將有助我們推動創科教育。

這份問卷調查大約需要 10 分鐘完成。所有答案只用作總匯分析和報告，並不會收集任何個人資料。
除回答問題外，歡迎你在問卷最後部分提供其他相關意見。

問卷調查中 STEM 教育定義為與編程、人工智能、物聯網、數據分析、機械人、無人機、電子競技、機械人工程、AR/ VR、航空、航天等相關科技與技術的培訓和教育。

Please choose the language for the survey
請選擇問卷的語言

- Chinese 中文
- English 英文

篜選問題

S1.　　你目前任教的學校屬於… (SA)

- 小學
- 中學

S2.　　你目前在以下哪類型學校工作…… (SA)

- 官立學校
- 資助學校
- 直資學校
- 國際學校
- 私立學校
- 其他

S3.　　你的職位是..... (SA)

- 教師/ 課程發展主任
- STEM 導師/ STEM 教育統籌主任（教師職級）
- STEM 教育統籌主任（非教師職級）
- 校長/副校長 [Skip to Part II]

第一部分：STEM 教育的教學與培訓

Q1.　　你任教甚麼科目? (MA)

- 美術
- 語文 (英文、中文、其他)
- 數學
- 個人、社會及人文教育
- 體育
- 科學
- 資訊科技/ STEM，請註明科目/項目：＿＿＿＿＿＿＿＿＿＿＿＿
- 其他，請註明：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q2.　　你如何獲取與 STEM 相關的教學知識及培訓? (MA)

- 修讀大學 / 大專院校的 STEM 培訓課程
- 參加由教育局、創新科技及工業局、香港生產力促進局舉辦的教師培訓
- 參加由教師組織或非牟利團體 舉辦的 STEM 培訓課程
- 參加由 STEM 服務商或私人企業舉辦的校外教師培訓
- 參加校內教師培訓
- 個人經驗及網上自學
- 其他，請註明：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q3.　　你任教、負責或參與了 STEM / 創科教育有多久? (SA)

- 少於 1 年
- 1 至 2 年
- 3 至 4 年

- 5 至 6 年
- 7 至 8 年
- 9 至 10 年
- 11 年以上

Q4.   你認為你的知識和經驗足夠在學校推動 STEM/ 創科教育嗎? (SA)
- 足夠
- 一般
- 不足夠

Q5.   除教學外，你還需要負責其他 STEM 相關的事項 (如: 資料搜集、採購、撰寫計劃書……)
嗎? 如需要，大約佔你的工作多少時間? (SA)
- 不需要
- 少於 10%
- 大約 **20%**-30%
- 大約 40%-50%
- 超過 50%

Q6.   你認為學校投放在 STEM 教育的資源足夠嗎? (SA)
- 足夠
- 一般
- 不足夠
- 不了解

Q7.   你認為以下哪 3 項情況最能支援你在學校教授 STEM/創科教育? (MA, only allow to choose 3)
- 增加在 STEM/創科教育教學和行政方面的人力支援
- 提供更多教授 STEM 的設施和設備
- 提供持續培訓以學習最新科技知識
- 投放更多資源舉辦 STEM 工作坊/ 活動
- 學校訂立明確的 STEM/創科教育教學方針
- 與其他學校/教師交流

- 與校外 STEM 教育專家及機構合作
- 其他，請註明：

第二部分：STEM 教育在學校設置和資源

Q8. 你的學校是採用以下哪些模式教授 STEM 課程? (MA)
- STEM 課程是一個必修科目，由專責老師教授
- STEM 內容包含在綜合科學、科技或相關學科內
- 設有 STEM Lab (體驗室) 供學生及老師使用
- 利用學校資源，定期以課外活動形式讓學生參與
- 需申請資助，不定期以課外活動形式讓學生參與，並聘請 STEM 教育供應商任教
- 以上都不是，請註明：_____

Q9. 一般情況下，是否所有學生都有機會參與校內的 STEM/創科教育? (SA)
- 是，所有學生都可參與
- 是，但學生須支付課程費用
- 不，學生是經由學校甄選才能參與

Q10. 貴校有否申請「中學 IT 創新實驗室」計劃或「奇趣 IT 識多啲」計劃？你認為這些計劃對加強學校的 STEM 教育有用嗎？(SA)
有申請：
- 非常有用
- 一般
- 沒有作用，原因是：_____
沒有申請，原因是：
- 我不知道有這些計劃
- 學校不需要額外資源
- 學校工作繁忙，缺乏人手處理
- 申請繁複，需要多些時間了解
- 計劃明年申請
- 其他，請註明：_____

Q11. 貴校於 2021/22 學年的 STEM 課外活動之資源或資助來源是? (MA)
- 學校財務預算
- 「中學 IT 創新實驗室」計劃 /「奇趣 IT 識多啲」計劃
- 教育局提供
- 優質教育基金
- 家長自籌資金/學校基金會
- 非牟利機構或其他來源
- 在這學年沒有安排任何與 STEM 相關的課外活動

Q12. 你認為以下哪些是有助學校發展 STEM/ 創科教育的主要因素？請選擇最重要的 5 個因素。(MA, only allow to choose 5)
- 增添負責 STEM 教育的老師/助理
- 增設 STEM 教育統籌專員（非教師職級）
- 採用以學生需求為首要或標準化的 STEM 教學課程
- 採用國際認可的 STEM 教育標準
- 有恆常和專門為實施 STEM 教育而設的資源和資金
- 資助學校購買硬件/軟件
- 為教授 STEM 的教師提供定期的科技培訓
- 在校內安裝智能設施，以激發學生的興趣並使學生能夠體驗或提升學生對科技的應用
- 獲得科技公司的支持，例如為學生提供講座和安排參觀
- 安排更多 STEM 的活動，讓學生有更多機會參加本地或國際的 STEM 比賽
- 與家長加強溝通，以使家長明白 STEM/ 科創教育的重要性，讓學生能於課外時間參與相關活動

第三部分 TechEd (創科教育) 和未來技能

Q13. 你認為以下哪些是學生裝備未來不可缺少的技能？請選擇最多 5 項。 (MA, only allow to choose 5)
- 航空航天技術
- 人工智能/機器學習

- 雲端運算
- 網絡安全
- 數據分析
- 金融科技/金融知識
- 遊戲和視頻製作
- 綠色科技及持續性
- 領導力與企業家精神
- 多媒體設計（插畫設計、影片剪輯等）
- NFT (Non-fungible token)/ 區塊鏈
- 機械人工程
- 講故事/演講技巧
- 虛擬現實 (VR)/擴張現實 (AR)
- 其他，請註明：_____

Q14. 你認為學生應該在哪個階段開始學習 STEM/創科教育? (SA)
- 小一至小三
- 小四至小六
- 中一至中三
- 中四至中六
- 大專或大學以上

Q15. 你對 STEM/創科教育和未來技能的其他意見：[Optional]

_____

_____

背景資料

D1. 你的性別是? (SA) [Optional]
- 男
- 女

D2. 你的年齡是? (SA) [Optional]
- <25

- 25-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 60+

D3. 你的最高的學歷是? (SA) [Optional]

- 文憑 Diploma /證書 Certificate
- 學位教師教育證書課程 (PGCE)
- 學士文憑 (BA/ BSc/ BEd/ BEng/ LLB etc.)
- 碩士文憑 (MA/ MSc etc.)
- 博士文憑 (PhD etc.)

D4. 你主修的科目是? (MA) [Optional]

Architecture 建築
Business & Economics 商業與經濟
Computer Science & Mathematics 資訊科技與數學
Education 教育
Engineering 工程
Hospitality 酒店服務業
Languages & Humanities 語文與人文學
Law 法律
Medicine 醫學
Natural Sciences 自然科學
Philosophy & Religion 哲學與宗教
Social Sciences 社會科學
Visual & Performing Arts 視覺與表演藝術
其他，請註明 :

D5. 感謝你對 STEM 教育的興趣。你想收到由生產力局發放的 STEM 資訊嗎？

- 不想 (end the survey)
- 想, 請提供電子郵件 (optional) _____

-完-

Appendix 5 Email message to Parent/ Educator and Social Media Post

Email message to Parent & Educator

Dear parents,

Hong Kong Productivity Council (HKPC) strives to nurture future technology talents in Hong Kong. In recent years, STEM education has become an important part of school curriculum and activities. To better **understand the implementation, effectiveness and development of STEM education and FutureSkills** in Hong Kong, HKPC is conducting a survey, inviting parents of local secondary and primary schools to participate.

Your opinion is important and valuable in bolstering TechEd development. Your constructive suggestions and views help **promote the wider application of TechEd in Hong Kong**, so as to **equip teachers and students with knowledge and skills in the I&T field** and get prepared for the future.

If you are interested, please click the following link and complete the questionnaire before 13 October 2022.

Best regards,
Inno Space

Dear school principals, STEM teachers and educators,

Hong Kong Productivity Council (HKPC) strives to nurture future technology talents in Hong Kong. In recent years, STEM education has become an important part of school curriculum and activities. To better **understand the implementation, effectiveness and development of STEM education and FutureSkills** in Hong Kong, HKPC is conducting a survey, inviting local teachers and educators from secondary and primary schools to participate.

Your opinion is important and valuable in bolstering TechEd development. Your constructive suggestions and views will help **promote the wider application of TechEd in Hong Kong**, so as to **equip teachers and students with knowledge and skills in the I&T field** and get prepared for the future.

If you are interested, please click the following link and complete the questionnaire before 13 October 2022.

Best regards,
Inno Space - 知創空間

Post on social media

【全港性 2022 科技教育網上問卷調查】

為深入探討香港 #創科教育 #TechEd 現況，#生產力局開展咗「全港家長教師 STEM 網上問卷調查 2022」，調查結果可以讓我地更了解教育界喺推行、實施同發展創科教育嘅挑戰和痛點，喺培訓未來人才上作出針對性嘅政策支援。

生產力局誠邀全港中小學教育工作者及家長參與今次網上問卷調查，為推動創科教育出一分力。問卷調查更得到 #香港教育工作者聯會創科教育中心 及 #香港理工大學專業及持續教育學院支持，結果會喺 12 月中公布!

如果你係校長老師:
如果你係家長：https://hkpcsurvey.quokkahr.com/#/survey/parent

#hkpc #知創空間 #科技教育 #InnoSpace #FutureSkills #2022 科技教育網上問卷調查 #中小學 #網上問卷調查 #全港中小學

Appendix 6a Other Opinions on STEM/ technology education by Parent－ (Transcript of Question 15)

11 comments from English questionnaires & 103 comments from Chinese questionnaires

Definition of STEM

- I am much perplexed with the fact that Visual Arts and Music but not STEM are among Internal Examinations for the purpose of Secondary School Places Allocation (SSPA).
- Give sufficient time for thinking and hands on, no hurry for result & modular and structured, stimulate by daily life need
- 非必要，只能當興趣
- 是一門技能，但重要是語文表達能力和思維，stem 是幫助表達工具之一。
- 不斷進步
- Stem is important
- 學技不斷進步，stem 都係要識的
- 學者無涯
- 應該要學習
- 完全你接觸過这科目。
- 讓家長明白多啲什麼是 Stem,才可以和小朋友一起溝通、思考和進步。謝謝！
- STEM 是綜合課，香港大部分興趣班誤解為科技電子課題。令 STEM 原意模糊化。

⇨ *Some parents are not sure what STEM is. Students should learn STEM as it is important and technology is evolving. STEM is a skill/ tool.*

Expectation on STEM

- 創科人才必需從少培養及教導。可惜現在資助學校沒有把創科教育定必修科，小女學校只係把比賽資料給予學生，並沒有教授相關知識，所以很少學生參加。如果創科教育是未來技能，教會局應該肩付培養的任責，否則學生便缺乏此技能。
- 不能只講 STEM，也要講做人的質素, 要加入人文素養
- 擴充視野，貼近現實發展，培養興趣
- Good to learn for students to know their future. Knowing what they are challenging.

- Stem should be a common knowledge n common sense in a concept for everyday life, everyone know how to connect n making solution for their new idea/ way to solve things by means of stem, not the investor, company owner to employ someone to investigate n make something useful for sale by stem
- 希望學生學會 STEM 後能夠至少成為一技之長！
- 要在未來發展新科技：令生活，資源，更加普及
- 從小提供不同的 STEM 知識以引發孩子的興趣
- more stem activities that related to life show and guide them to explore, doing experiment, review and analysis, that can stimulate kids' interest on it, once they are interest, more easy to teach and explore by themselves
- 希望讓小孩有更多的機會接觸 STEM
- 學校應該提早讓學生接觸及了解 STEM， 以致他們能夠熟悉及了解其對將來社會的影響
- 因為現在是科技的年代，我們需要學更多技能幫自己脫貧致富，幫國家強大
- 非常支持小朋友早點認接觸 STEM ，將來全世界都會以科技及大數據作為人類生活不可決少的一部份和源素
- 科技與人並存。 當科技取代了人類， 哪裡來要被服務及使用的對象。
- 給孩子們多動手操作的機會
- 未來大部份都以科研取代，小朋友應更早接觸，才能在未來有更大的發展方向
- 同時希望可以提供一些 stem 課程給家長，而非只供老師學習。

⇨ *Technology is future skills, will substitute lots of manual work. Government should lead STEM education - provide for all at early stage, make it interesting and hands-on, broaden students' horizons. STEM training also for parents. Not just hard skills, should also be character building.*

Approach to Develop/ Teach STEM
- Singapore's English standards are very high. Hong Kong's English standards are poor. If Hong Kong SAR wants to be a leading centre for STEM, the English skills of the local population must be excellent. The reality is that English is the language of global commerce. Even STEM companies in Shanghai and Beijing use English as their primary language in the HQ office. Hong Kong needs to improve its English, immediately!
- Government to encourage more daily exposure through seminars and workshops for parents to participate with their children outside of school activities to arouse interest

- 一般老師都不認識什麼創新科技，應該增加多啲線上科技教學活動大規模培訓學生。
- 傳統學校已經不能夠教授未來實用科技, 希望教育局引入創科機構提供第三方教學
- 於主料如中英數加入 Stem 元素。如在課堂抽點時間運用據教育意義的線上遊戲，增加小朋友的學習動機及興趣。現在 stem 課程進度落後，要適當地加快腳步。
- 坊間太注重編程/機械人，配以周邊商業產品，令 STEM 變質。宜回歸由科學作主道，延伸至工程、科技、數學，減少商業活動。 STEM 在學校課時要增加，取代過時的家政科、會計科等。 同時不要將 STEM 與國安掛鉤，引起學生負面觀感。
- 可以增加網上自學課程，解決導師不足問題。
- 下午時段開多些網上課讓學生接觸更多，學習不同應用。
- 要達至 學以致用！ 多機會接觸和學習，之後，比機會學生從學習/生活上發揮所學的 STEM！
- 提供學習平台，空間，機會給孩子享受 stem 課程
- 可嘗試在中學教育內增加 STEM 專責部門及多位專責老師

⇨ *Content - integrate with main subjects, not just focused on coding/ robotics, substitute obsolete subjects. Teaching staff – online courses to supplement insufficient teaching staff or school hours, need dedicated staff. Need good English to learn STEM. More workshops for parents to participate with children. Focus more on STEM applications.*

Who should learn STEM
- 應該普及到全港
- 希望能夠將 STEM 教育普及到每一位小學生，讓更多小朋友接觸和認識創科教育，培養創新思維
- 增加普及化，但不要硬性考試常規化，令孩童能活學活用，增加趣味性，才能發展創意思維
- 希望政府提供資源，令所有小朋友可以學習 stem，將 stem 普及化！
- 要設定為學生必修科
- Stem 是必須，學校其實教很少，如果可以普及化讓更多學生參與，香港就會有好多人材。

⇨ *STEM for all*

When to start STEM

- Can start in Kindergarten actually
- 建議將 stem 轉為小學正規課程，但到某年級可分細科給同學選擇（如 prog related, digital art, aviation)
- 從幼稚園開始學習
- 希望可以由細開始普及學習
- Learn in primary school is so important
- 盡早開發，走得更遠！

⇨ *Start as early as possible, even from kindergarten*

Curriculum & Standards

- Hong Kong should have a structured syllabus for each level of school so they could pick up STEM knowledge and skill sets to keep up with the pace of the trend
- STEM assessment should be made as compulsory - just like Chinese, English, and Mathematics - in both Internal Examinations for the purpose of Secondary School Places Allocation (SSPA) and DSE.
- 列入 DSE 分數計算
- 將 STEM 课程規範化
- 大學入學計分 stem 有得加乘，讓家長願意給孩子放多些時間学習。
- 希望香港政府要研究好一套 STEM 教學方法和足夠宣傳教育家長們。這才相得益彰！
- 各校課程或資源不同，難統一公平評核。
- 與學科作更好的聯繫
- 我個人認為以香港從前的金融中心地位應該在中学大力推行網絡保安相關教育，以發展成可銜接亞太區及全球金融網絡體系的先導計劃支援中学與大學連接，

⇨ *Standardize STEM curriculum & grading, link to other related curriculum. The grading should be Included in DSE/ university entry requirement.*

Training/ Sufficient STEM Teacher
- We need to do more to support educators to build their capacity to become confident to teach STEM subjects at school. There is not enough professional development resources or time allotted for teachers.
- 要有足夠發展 Stem 的師資
⇨ *Need more STEM teachers and more training for them*

Resources/ Support
- 政府應提供更多資源予學校發展 STEM 課程
- 政府提供資源平台，聯動學校和創科企業，才能跟上行業最新發展
- 希望能更多的投放資源在 STEM 教育上，為未來做出更大的貢獻。謝謝
- 希望教育局可以撥款給學校，讓學校多一些資源去推廣與學習 Stem, 讓大家學生在新世代受益與生活
- 政府應為 STEM 教育相關的私營機構及學校提供更多資源上的支援, 幫助建立行業生態
- 政府要合理地增加資源在此科教育上
⇨ *Government to provide more resources on STEM education*

Fees of STEM activities
- 無錢無能力參加
- 講價錢非常重要，好多時因為價錢已放棄選擇參與活動，對基層來說非常重要
- 增加多 D 免費教學平台
- 坊間有很多課程，但價錢很貴
⇨ *Some found STEM activities expensive, want free courses*

STEM Competition
- 坊間好多 stem 比賽都需要團體或經學校報名，例如之前科創展，都要由學校報名先可以參加，有些小朋友可能學術成績方面不太名列前茅，連報名參加的機會亦沒有，如果可以由家長代表報名，或許可以吸引更多學生參與。

- 學界應多安排比賽或交流會讓國際不同先進地區的學生可互相切磋及學習。
- 多搞一些由主辦單位可以協助小朋友參與的比賽作支援

⇨ *Participation/ support in international competition to learn more about STEM & entry for competition not just based on academic achievements*

Promotion STEM
- more promotion
- 不清楚不熟悉 STEM 課程，應多些資訊宣傳課程內容和學習的用意及好處
- 學校鼓勵同學多啲參與
- 希望更廣泛使用及推廣
- 希望由政府大力推動大藍圖，向全校學校增加資源及發展方向，可以在一些重點中/小學推出更前瞻的項目

⇨ *More promotion, government to lead*

Appendix 6b Other Opinions on STEM/ technology education by Educator – (Transcript of Question 15)

10 comments from English & 52 comments from Chinese questionnaires (not all are relevant comments)

Definition of STEM
- 利用運算思維有系統地解決日常生活的問題
- 家長白明白
- 夠創新

⇨ *Innovative, help daily life, but not clear to parents*

Approach to Develop/ Teach STEM
Comprehensive STEM education
- 應全方位落實 STEM 教育

STEM course to work with other subjects
- More collaborative works between STEM-related subjects, most works are emphasized on Computer technology only.

- Explore the technology education which can facilitate the learning and teaching of English language

Formal staff
- 設立常額 STEM 教學統籌主任
- 專科專教，有老師職級在中學實施 STEM 教授
- teachers needs more time to develop or plan STEM curriculum/activities. DT lesson is important in STEM education, but most schools do not have it.

According to student's abilities/ interest and not a subject/ interest class
- 教育規劃應平衡學生個人發展以及小組合作能力，不應單以科技技術為唯一教學目的。
- 坊間到處都是 STEM 教育，到處都是買回來，再教，很少是自己創作或學生創作，我認為應該培訓教師引導學生創作能力，而不是興趣班這樣，買回來教，學生學了就忘記，而是要令學生終生受用。

Development of STEM : coordinate both hardware & software
- 要發展 STEM 教育，必須大軟硬件配合。軟件方面，培育教師 STEM 教學知識與技能；硬件方面，提供 STEM 學習環境、教學軟件和教具等。

Curriculum & Standards
- 如其他學科一樣，有一個統一的課程
- 公開考試無一科叫做 STEM
- 學校沒有專門課節
- 在高小開始至高中，納入正規課程
- 期望政府可為學校配對不同專業資歷的機構 修訂小學課程
- The establishment of a cross-curriculum in STEM by CDI
- 希望可以定為常規課程，讓所有學生可以經常接觸及不斷更新接受新事情，不像其他科目靠過往課文內容授教，需要與時俱進
- 教育局應該主導整個 stem 教育的放展，而非給錢後便讓學校完全自行發展，做成大量的資源浪費

- 學科定位不清，方向策略不明確
⇨ *Standardize syllabus (align with the changing times), become part of school curriculum & examination*

Resources

- EDB should tailor make at least 2 teaching post particularly for STEM teachers. Recurring grant (200000 or above) should be given to school every year instead of application for IT Lab funding (as this waste a lot of manpower & time, simply increase the burden of teachers!).
- 應該投放資源於創科教育上，培育具競爭力的下一代，但現在教育局未有統一指引，學校沒有持續的資源發展創科，當熟悉創科教育的老師離開學校，該校之前投放的資源就無以為繼，所以教育局應該增設 STEM 教育主任一職，以隱定學校有能力發展創科教育的老師。
- If HK Universities take STEM more serious than DSE results, then schools will invest in STEM. It is very little at the moment
- 沒有政府資源、STEM 指標及提供人才，在學校其實是推不到 STEM
- 中學每年 100 萬專款，實報實銷
- 學校沒有額外人手，真正實行的 STEM 教育基本上是沒有
- 小學資源極度不足
- 學校資源不夠
- 會否考慮設立恆常化的 Stem Grant？每年學校有$5-10 萬也好，可讓學校如 ITSSG 般滾存於 Stem Grant 之內，讓學校按校情，可每年小規模的更新，也可讓學校選擇儲 4-5 年錢，作大規模的工程
- 提供學校硬件配合 STEM 推廣
- 希望政府投放更多資源給學校
⇨ *Not sufficient resources (i.e. more regular teaching staff, general funding, hardware), formalize funding into regular grant/ scheme*

Training

- more training for teachers and manpower
- 有到校的 Teacher training

- 對在職教師提供的訓練並不多，而且即使有訓練，多數係需要老師付出自己的時間金錢，而且加大行政工作量，故學校老師一般都不太願意接觸 stem。
- 部分老師未有能力教學生
- 教師需要足夠的支援，培訓，才能裝備自己，有信心教授 Stem
- 多些培訓工作坊
- 增加教師專業知識
- 加強培訓教師如何將 STEM 教學融入各學科，每年在教學計劃中加入一至兩個相關教學重點。積累教學經驗。

⇨ *More training & support (although teacher's time already tight), bring training at school (vs. outside), training on how to integrate STEM into other subjects*

Promotion on STEM
- 持續推動 STEM/創科教育有助培育創科人才，對提升香港的競爭力也非常重要。
- 政府、工商機構、大中小學加強合作推動項目，高調宣傳，才會有人知道。

⇨ *More promotion, not just government and schools but also commercial fields*

Career & Opportunity
- Industry in Hong Kong is not thriving enough to give ample opportunity for students upon graduation; there is not enough appeal for young graduates to stay in Hong Kong and make career
- 對升學無直接幫助

⇨ *More opportunity, currently not that helpful for further studies*