

Professional Learning in STEM

Findings from the Annual STEM Practitioner Survey 2017/18

Early learning and childcare, primary, ASN and secondary

May 2019

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Executive summary

This report presents the key findings from Education Scotland's STEM annual practitioner survey 2018.

Introduction

To inform the development of the STEM Education and Training Strategy¹, published in October 2017, Education Scotland conducted extensive consultation with practitioners to gather information about career-long professional learning in sciences, technologies, engineering and mathematics (STEM).

As part of this consultation process, Education Scotland issued the first Annual STEM Practitioner survey. This covered the period from 1 August 2016 to 31 July 2017. The survey provided valuable insights into the professional learning needs of practitioners; the challenges they faced in accessing professional learning and what they saw as the most effective approaches. The findings from this survey² helped to shape the development of the career-long professional learning (CLPL) commitments outlined in the STEM Education and Training Strategy actions. The first annual report³ of the Strategy provides further detail about the progress which has been made in the initial year of implementation.

As part of its remit to enhance the STEM professional learning offer to practitioners in Scotland, Education Scotland will continue to measure progress against the following STEM Strategy key performance indicator:

Increased practitioner confidence in STEM learning in the early years, primary years and in CLD settings and increased practitioner engagement in STEM professional learning opportunities.

- *Increase the cumulative hours of STEM professional learning accessed by early years, schools and CLD practitioners annually.*

To support this process and to guide the next stage of implementation of the STEM strategy, Education Scotland issued the second set of annual practitioner STEM surveys in October 2018. This surveys gathered the views of practitioners in the following sectors:

- Early learning and childcare
- Primary
- Additional support needs (ASN)
- Secondary
- Community learning and development (CLD)

School-based technical support staff were not included in the 2018 survey. This is because a separate survey was developed specifically for them by SSERC and the Scottish Technicians Advisory Council. It is also worth noting that the survey issued to community learning and development (CLD) staff differed slightly from the versions issued to early learning and childcare settings and schools. This explains why responses from the CLD do not feature in every table in this report. In 2019, Education Scotland will seek to ensure further alignment in the surveys across various sectors.

¹ STEM Education and Training Strategy: <http://bit.ly/STEMstrategy>

² Findings from the annual STEM practitioner survey (2017): <http://bit.ly/2lbiegu>

³ First annual report of the STEM Education and Training Strategy: <https://www2.gov.scot/Resource/0054/00545868.pdf>

Key findings – 2018 Practitioner STEM CLPL survey

Number of responses

The number of survey responses increased by 11.2% from 788 responses in 2017 to 876 responses in the 2018 survey. There were significant increases in responses from the early learning and childcare, and also primary sectors. There was a decrease in responses from secondary practitioners.

- Early learning and childcare – **3.5%** in 2017 to **16.6%** in 2018.
- Primary – **35.5%** (274 responses) in 2017 to **43.6%** in 2018.
- Secondary – **58.5%** (461 responses) in 2017 to **38%** (334 responses) in 2018.

Practitioner CLPL hours and confidence

The total number of cumulative practitioner hours accessed by the 876 survey respondents between 1 August 2017 and 31 July 2018 = **18,675 hours**.

The average cumulative hours of STEM professional learning per practitioner between 1 August 2017 and 31 July 2018 = **21.32 hours**.

63.5% of practitioners who responded agree or strongly agree with the statement **“I feel confident delivering STEM Learning in my practice”**.

Sector	Total number of hours of CLPL	Average number of hours of STEM CLPL per practitioner	% of practitioners responded agree or strongly agree that 'I feel confident delivering STEM learning in my practice'
Additional support needs	135	9	46.67%
Early learning and childcare	2,798.5	19.3	42.76%
Primary	5,185.5	13.57	63.35%
Secondary	10,556	31.60	73.36%

Table 1: Number of practitioner CLPL hours per sector and confidence levels

On average, primary practitioners that responded accessed less than half of the hours of STEM CLPL undertaken by secondary practitioners. Of those that responded, practitioners from additional support needs settings accessed the least professional learning in STEM.

Compared to 2017 survey, 30.4% of 2018 survey respondents confirmed that the number of hours of CLPL they had undertaken was either more or a lot more. A total of 47.7% of 2018 respondents indicated that the number of hours of STEM CLPL they had undertaken was the same as in 2017.

Types of professional learning accessed by practitioners

The three most popular types of professional learning in STEM accessed by practitioners are:

- Professional reading/engaging independently with research 78.5% (598 responses)
- Collegiate working with centre/school 74.5% (688 responses)
- Collegiate working across cluster 53.9% (472 responses)

Main barriers to accessing STEM CLPL

The top three barriers are:

- Difficulty finding cover 54.3% (476 responses)
- Difficulty attending professional learning due to other commitments 40.5% (355 responses)
- Lack of funding to pay for professional learning 38.0% (333 responses)

Professional learning priorities for academic year 2018/2019

The top three priorities in relation to STEM are:

- Pedagogies/teaching approaches to deliver STEM learning effectively 50.6% (443 responses)
- Skills progression in STEM subjects 41.7% (365 responses)
- Awareness about the resources and support available for STEM 32.9% (289 responses)

Education Scotland response

In the first year of the STEM Education and Training Strategy, the focus for Education Scotland has been to put in place the key national infrastructure and resources to address the priorities and needs identified by practitioners.

Engaging with partners – Education Scotland has disseminated the findings from the 2017 annual STEM Practitioner survey to a range of partners and STEM providers. This has helped STEM partner organisations to plan and shape their professional learning offers to align more closely to the needs of practitioners and to the new national model of professional learning.

RAiSE Programme – The Raising Aspirations in Science Education (RAiSE) programme aims to build the capacity of practitioners, particularly in primary school settings, to deliver inspiring and engaging learning in science and STEM. The RAiSE Programme is a four-year pilot programme led by Education Scotland and funded by The Wood Foundation, Scottish Government and participating local authorities. The programme was established in 2016 and in its first phase engaged eight local authorities: Highland, West Dunbartonshire, Angus, City of Edinburgh, Dumfries & Galloway, Fife, Glasgow City, Moray. In January 2019, the programme was extended to a further four local authorities.

Enhancing Professional Learning in STEM Grants Programme – This new grants programme was launched in October 2018 to build the capacity and confidence of practitioners. In the first round of the grants programme, over £187,000 was allocated to 24 regional and national projects⁴ to enhance provision of professional learning to most target sectors including early learning and childcare, primary, secondary, CLD and technicians. Education Scotland will be launching a further round of grant funding in May 2019.

Education Scotland's Regional Teams – Education Scotland has recruited new teams to extend and support local and regional provision of CLPL in partnership with the Regional Improvement Collaboratives. This includes the recruitment of new STEM Education Officers, Improving Gender Balance and Equalities Education Officers as well as officers for Numeracy and Mathematics and Community Learning and Development.

⁴ Overview of Enhancing Professional Learning in STEM Grants Programme 2018/19: <http://bit.ly/2P16ded>

Next steps

Education Scotland would like to express its sincere thanks to all those who completed and helped to promote the 2018 practitioner survey. The information provided by the survey is enormously helpful and has very much helped to shape and influence our plans. As ever, we are very grateful to everyone for their support.

The coming year will bring many exciting developments as the STEM Strategy gathers momentum. Education Scotland staff are now working within regional teams and are working in close partnership with local authorities and Regional Improvement Collaboratives to support their STEM plans. A core aim of these new teams will be to help to build capacity and to enhance partnership working to share practice and support improvement.

Education Scotland, with support from the Scottish Government, will launch a new round of the Enhancing Professional Learning in STEM Grants Programme in May 2019. This will seek to build on the achievements of Round One and will introduce a new Leadership and Collegiate Professional Learning Fund to support practitioner-led and cluster-based activity.

The impact of the four-year RAiSE pilot programme has been reviewed through a process of external evaluation. The initial evaluations of this pilot have been very positive. The final evaluation report is due by May 2019 and will inform decisions about the extension of the programme to other authorities across Scotland to further build practitioner confidence and capacity.

About the survey

Background

The aim of the Annual STEM Practitioner Survey is to track enhancements in STEM professional learning undertaken by practitioners in early learning and childcare, primary, secondary and additional support needs sectors.

The survey covers aspects such as:

- Number of cumulative hours of STEM CLPL accessed
- Practitioner confidence in delivery of STEM learning
- STEM professional learning priorities of practitioners
- Barriers to accessing CLPL.

The scope of the 2018 survey was extended slightly to also gather views of other practitioners involved in delivering aspects of STEM learning including classroom assistants, school librarians and practitioners of other curriculum areas. In addition, separate surveys were issued to:

- Community and learning development practitioners
- Organisations that provide STEM professional learning (the STEM Provider Survey)
- School-based technical support staff (developed and promoted by SSERC and the Science Technicians Advisory Council).

Structure and purpose

The Annual STEM Practitioner Survey was made available on-line to all practitioners within early learning and childcare, primary, secondary and additional support needs sectors. It was promoted via Education Scotland and Scottish Government communication channels. The survey comprised four sections:

- About you
- Your professional learning
- STEM in your practice
- STEM in your setting.

The survey findings have played, and will continue to play, a crucial role in shaping the implementation of the CLPL actions in the STEM Education and Training Strategy (<http://bit.ly/STEMstrategy>).

The findings have directly influenced the framing of Round 1 of the Enhancing Professional Learning in STEM Grants Programme which saw £187,000 allocated to 24 professional learning programmes. This grants programme will seek to ensure that practitioners in relevant sectors, and in various geographical locations, have access to high-quality professional learning which meets their needs. The survey highlights priority areas for action and gaps that need to be addressed.




The evidence provided by the surveys are also directly informing the work and CLPL offer of Education Scotland's new regional teams. These teams will play a key role in supporting and coordinating professional learning in STEM.




In addition, the survey data allows Education Scotland to track progress against the following key performance indicator (KPI) in the STEM Education and Training Strategy:






II. Increased practitioner confidence in STEM learning in the early years, primary years and in CLD settings and increased practitioner engagement in STEM professional learning opportunities.

- Increase the cumulative hours of STEM professional learning accessed by early years, schools, college and CLD practitioners annually




ASN sector – summary of responses




Number of responses		Number of hours of STEM CLPL		Agree/strongly agree they are confident in delivering STEM	
	Total		Total/Average		Total
	15		135 / 9		46.7%






How easy is it to access professional learning in STEM?		Was there sufficient choice on offer in STEM professional learning?		Do you have a STEM partner?	
	Easy – Very Easy		Yes – Definitely		Yes
	0%		6.7%		26.7%

Top three highlights	
	<p>Types of professional learning accessed:</p> <ul style="list-style-type: none"> • Collegiate working within centre/school • Professional reading/engaging independently with research • Online network of practitioners.
	<p>Barriers to accessing professional learning:</p> <ul style="list-style-type: none"> • Difficulty finding staff cover • Difficulty in attending professional learning due to other commitments • There is no suitable professional learning available.
	<p>Professional learning provided by:</p> <ul style="list-style-type: none"> • Local authority • STEM Ambassadors • Local employers/businesses.
	<p>Learning priorities for 2018/2019:</p> <ul style="list-style-type: none"> • Awareness about the resources and support available for STEM • Pedagogies/teaching approaches to deliver STEM learning effectively • Equal third place - <ul style="list-style-type: none"> How to lead and coordinate STEM in my setting Using STEM as context to raise attainment in literacy/numeracy Improving equity and equality in STEM learning.
	<p>How can STEM professional learning be improved?</p> <ul style="list-style-type: none"> • More simplified and play-based learning options. • More online professional learning opportunities. • More face-to-face professional learning opportunities.




Early learning and childcare – summary of responses




Number of responses		Number of hours of STEM CLPL		Agree/strongly agree they are confident in delivering STEM	
	Total		Total/Average		Total
	145		2,798.5 / 19.3		42.8%






How easy is it to access professional learning in STEM?		Was there sufficient choice on offer in STEM professional learning?		Do you have a STEM partner?	
	Easy – Very Easy		Yes – Definitely		Yes
	22.1%		22.1%		11.7%

Top three highlights	
	<p>Types of professional learning accessed:</p> <ul style="list-style-type: none"> Professional reading/engaging independently with research Collegiate working within my centre/setting Joint third place - Collegiate working across my cluster Attending an externally provided course outside of my school.
	<p>Barriers to accessing professional learning:</p> <ul style="list-style-type: none"> Difficulty finding staff cover There is no suitable professional learning available Difficulty in attending professional learning due to other commitments.
	<p>Professional learning provided by:</p> <ul style="list-style-type: none"> Local authority Education Scotland STEM Ambassadors.
	<p>Learning priorities for 2018/2019:</p> <ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Understanding of the concepts and knowledge that underpin mathematics/numeracy Awareness about the resources and support available for STEM.
	<p>How can STEM professional learning be improved?</p> <ul style="list-style-type: none"> More simplified and play-based learning options More face-to-face professional learning opportunities More online professional learning opportunities.




Primary sector – summary of responses




Number of responses		Number of hours of STEM CLPL		Agree/strongly agree they are confident in delivering STEM	
	Total		Total/Average		Total
	382		5,185.5 / 13.57		63.4%






How easy is it to access professional learning in STEM?		Was there sufficient choice on offer in STEM professional learning?		Do you have a STEM partner?	
	Easy – Very Easy		Yes – Definitely		Yes
	36.9%		32.9%		25.9%

Top three highlights	
	<p>Types of professional learning accessed:</p> <ul style="list-style-type: none"> Professional reading/engaging independently with research Collegiate working within my centre/setting Collegiate working across my cluster Attending an externally-provided course outside of my school.
	<p>Barriers to accessing professional learning:</p> <ul style="list-style-type: none"> Difficulty finding staff cover Difficulty in attending professional learning due to other commitments Lack of funding to pay for professional learning.
	<p>Professional learning provided by:</p> <ul style="list-style-type: none"> Local authority SSERC STEM Ambassadors.
	<p>Learning priorities for 2018/2019:</p> <ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Skills progression in STEM subjects Awareness about the resources and support available for STEM.
	<p>How can STEM professional learning be improved?</p> <ul style="list-style-type: none"> More face-to-face professional learning opportunities More simplified and play-based learning options More opportunities to engage/collaborate with other STEM practitioners.

Secondary sector – summary of responses

Number of responses		Number of hours of STEM CLPL		Agree/strongly agree they are confident in delivering STEM	
	Total		Total/Average		Total
	334		10,556 / 31.6		73.4%

How easy is it to access professional learning in STEM?		Was there sufficient choice on offer in STEM professional learning?		Do you have a STEM partner?	
	Easy – Very Easy		Yes – Definitely		Yes
	26.9%		28.1%		32.0%

Top three highlights	
	<p>Types of professional learning accessed:</p> <ul style="list-style-type: none"> Professional reading/engaging independently with research Collegiate working within my centre/setting Joint third place - Online network of practitioners Attending an externally provided course outside of my school.
	<p>Barriers to accessing professional learning:</p> <ul style="list-style-type: none"> Difficulty finding staff cover Difficulty in attending professional learning due to other commitments Lack of funding to pay for professional learning.
	<p>Professional learning provided by:</p> <ul style="list-style-type: none"> SQA Joint second place – SSERC & local authority Learned societies.
	<p>Learning priorities for 2018/2019:</p> <ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Support for National Qualifications in STEM subjects Skills progression in STEM subjects.
	<p>How can STEM professional learning be improved?</p> <ul style="list-style-type: none"> More face-to-face professional learning opportunities More opportunities to engage/collaborate with other STEM practitioners More opportunities to visit other settings/organisations.

Section A – About you

This section compares the findings from the 2017 and 2018 annual STEM practitioner CLPL surveys.

Number of responses

2016/17 Practitioner CLPL Survey	788 Responses
2017/18 Practitioner CLPL Survey	876 Responses

Table 2: Number of responses to the 2017 and 2018 annual STEM practitioner surveys

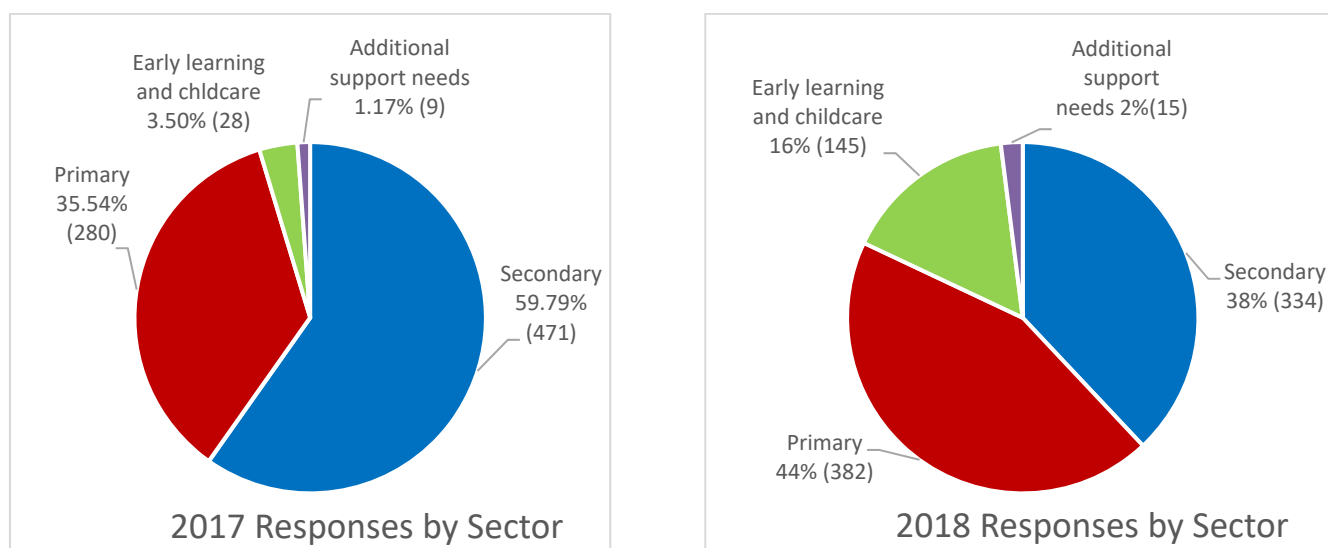


Figure 1: Number of responses by sector from 2017 and 2018 surveys

The number of responses increased by **11.2%** from 788 responses in 2017 survey to 876 responses in 2018 survey. There were significant increases in responses from early learning & childcare and primary sectors. However, the number of responses from secondary decreased.

Important: The significant shift in responses from sectors between the 2017 and 2018 practitioner surveys should be considered when analysing 2017/18 comparative data in this report.

Sector	2017	2018
Additional support needs	1.17%	1.71%
Early learning & childcare	3.50%	16.55%
Primary	35.54%	43.61%
Secondary	59.79%	38%

Table 3: Number of responses by sector

Response by role

There were significant increases in percentage of responses from classroom teachers, DHT/headteachers and early learning and childcare practitioners. Factors such as enhanced promotion of the survey in the early years and childcare sector could contribute to these increases. The decrease in the numbers of technicians' responses was expected as technicians were encouraged to instead complete the specific technicians' survey issued by SSERC in partnership with the Scottish Technicians Advisory Council.

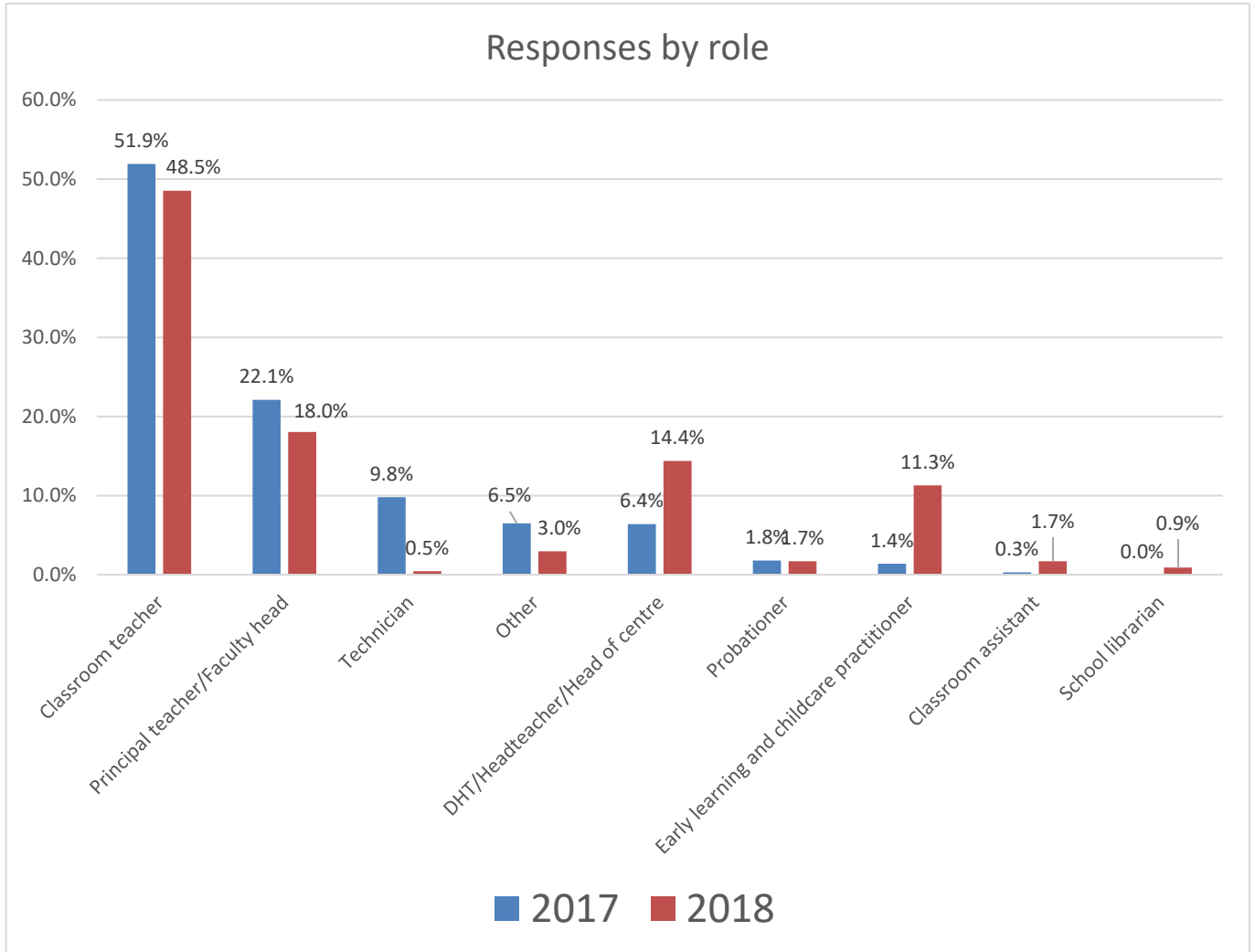


Figure 2: Breakdown of survey responses by role

Analysing the data further per sector provides the following breakdown.

Practitioner role	Total response %	Response %			
		Additional support needs	Early learning and childcare	Primary	Secondary
Classroom teacher	48.5% (425)	53.3% (8)	0% (0)	57.9% (221)	58.7% (196)
Principal teacher/Faculty head	18.0% (158)	20.0% (3)	1.4% (2)	13.3% (51)	30.5% (102)
DHT/Headteacher/Head of centre	14.4% (126)	13.3% (2)	24.1% (35)	19.9% (76)	3.9% (13)
Early learning and childcare practitioner	11.3% (99)	0% (0)	68.3% (99)	0% (0)	0% (0)
Classroom assistant	1.7% (15)	0% (0)	0% (0)	3.1% (12)	0.9% (3)
Probationer	1.7% (15)	0% (0)	2.1% (3)	2.1% (8)	1.2% (4)
School librarian	0.9% (8)	0% (0)	0% (0)	0% (0)	2.4% (8)
Technician	0.5% (4)	0% (0)	0% (0)	0% (0)	1.2% (4)
Other	3.0% (26)	13.3% (2)	4.1% (6)	3.7% (14)	1.2% (4)
Total response count	876	15	145	382	334

Table 4: Response by practitioner role by sector

Note: ■ Indicates top 3 responses

By curricular area

Significant increases in percentage of responses from **'all curriculum areas'** may be as a consequence of the enhanced promotion of the survey within the early years and childcare sector.

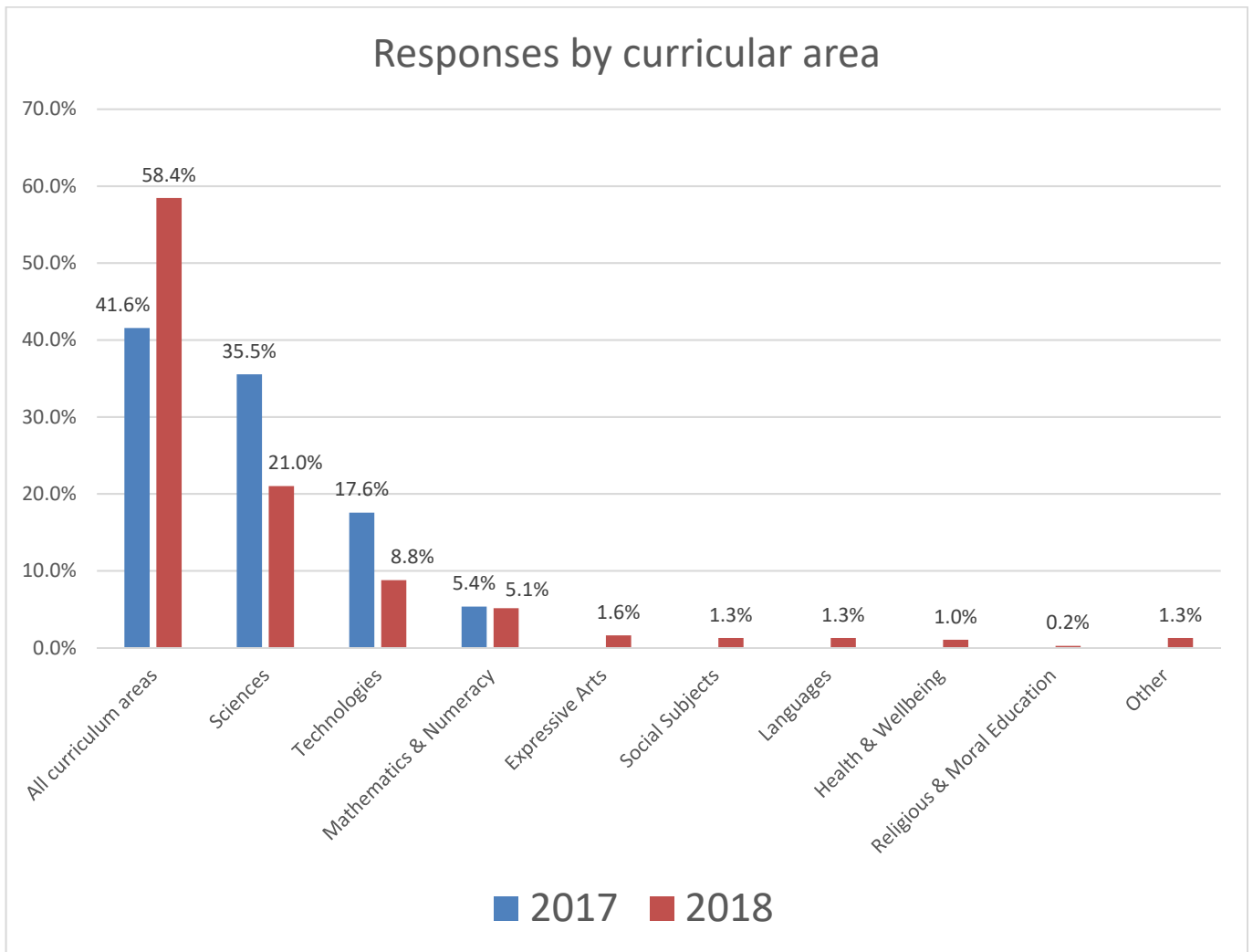


Figure 3: Breakdown of response by curricular area

Analysing the data further per sector provides the following breakdown.

Subject area	Total response %	Response %			
		Additional support needs	Early learning and childcare	Primary	Secondary
All curricular areas	58.4% (512)	40.0% (6)	97.9% (142)	92.9% (355)	2.7% (9)
Sciences	21.0% (184)	6.7% (1)	0% (0)	3.7% (14)	50.6% (169)
Technologies	8.8% (77)	13.3% (2)	0% (0)	0.8% (3)	21.6% (72)
Mathematics & Numeracy	5.1% (45)	20.0% (3)	0% (0)	0.8% (3)	11.7% (39)
Expressive arts	1.6% (14)	0% (0)	0% (0)	0% (0)	4.2% (14)
Social subjects	1.3% (11)	6.7% (1)	0% (0)	0% (0)	2.9% (10)
Languages	1.3% (11)	0% (0)	0% (0)	0.8% (3)	2.4% (8)
Health & Wellbeing	1.0% (9)	0% (0)	0.7% (1)	0.3% (1)	2.1% (7)
Religious & moral education	0.2% (2)	0% (0)	0% (0)	0% (0)	0.6% (2)
Other	1.3% (11)	13.3% (2)	1.4% (2)	0.3% (3)	1.2% (4)
Total Response Count	876	15	145	382	334

Table 5: Response by subject taught by sector

Note: ■ Indicates top 3 responses

Section B – Your professional learning

The **total number of cumulative hours** of practitioner professional learning in STEM accessed by the 876 survey respondents between 1 August 2017 and 31 July 2018 was **18,675 hours**. This is an average of **21.32 cumulative hours per practitioner per annum**. Secondary sector practitioners that responded accessed an average of 31.60 cumulative hours of STEM professional learning between 1 August 2017 and 31 July 2018.

Sector	Number of responses	Total number of hours of STEM CLPL	Average number of hours of STEM CLPL per practitioner
Additional support needs	15	135	9
Early learning and childcare	145	2,798.5	19.3
Primary	382	5,185.5	13.57
Secondary	334	10,556	31.60

Table 6: Number of practitioner CLPL hours by sector

Some 30.4% (266 responses) of 2018 survey respondents confirmed that the number of hours of CLPL they undertook in 2017/18 '**was more or a lot more**' to that they undertook in 2016/17. Almost one half of 2018 respondents said the professional learning they accessed was about the same as in 2016/17.

Number of CLPL hours in 2018 compared to 2017 survey period	% of responses	Number of responses
A lot more	7.8%	68
More	22.6%	198
About the same	47.7%	418
Fewer	16.55%	145
A lot fewer	5.37%	47

Table 7: Comparison of number of hours in 2018 survey compared to 2017 survey period

The year leading up to October 2018 represented the first year of implementation of the STEM Education and Training Strategy. The focus for this period was the establishment of support structures such as the Enhancing Professional Learning in STEM grants programme and the recruitment of the new Regional STEM Advisor team. The impact of these support mechanisms will, in part, start to be measured in the 2019 and 2020 Annual STEM Practitioner Survey.

What types of professional learning did you access and what was the impact?

Responses indicate that there has been a significant increase from the 2017 survey to 2018 survey in relation to the following professional learning formats: collegiate working in settings and across clusters, professional reading/engaging independently with research and also support from online networks and social media.

Types of professional learning in STEM that have been accessed by practitioners	2017	2018	2018
	Response %	Response % (Response count)	Impact of type of professional learning 'high and very high'
Attending an externally-provided course outside of my school	49.42%	53.5% (469)	71.4% (335)
Collegiate working across my cluster	28.40%	53.9% (472)	48.3% (228)
Collegiate working within my centre/school	43.06%	74.5% (653)	61.7% (403)
External company/organisation coming into my school	17.12%	37.9% (332)	59.0% (196)
Formal learning through a university/college course	8.30%	24.8% (217)	40.6% (88)
Online learning	25.81%	37.9% (332)	38.3% (127)
Online network of practitioners	12.84%	49.2% (431)	46.4% (200)
Webinars	*	32.6% (286)	37.1% (106)
Attending local, regional and national events to share STEM ideas and practice	*	45.8% (402)	65.7% (264)
Attending open day visits to other schools/settings/organisations with interesting STEM practice	*	33% (289)	56.4% (163)
Professional reading/engaging independently with research	40.08%	78.5% (688)	58.1% (400)
Social media – Twitter/Facebook etc	17.25%	45.8% (401)	37.4% (154)
Other	12.84%	15.9% (139)	N/A

Table 8: Types of professional learning accessed by practitioners and the impact on learning

Note: ■ Indicates top 3 responses

* Indicates question not in survey

Types of professional learning in STEM that have been accessed by practitioners	Total response % (Response count) (876)	% of respondents that engaged in type of professional learning per sector			
		Additional Support Needs (15)	Early learning and childcare (145)	Primary (382)	Secondary (334)
Attending an externally-provided course outside of my school	53.5% (469)	53.3% (8)	47.6% (69)	52.1% (199)	57.8% (193)
Collegiate working across my cluster	53.9% (472)	46.7% (7)	47.6% (69)	55.5% (212)	55.1% (184)
Collegiate working within my centre/school	74.5% (653)	66.7% (10)	60.0% (87)	77.7% (297)	77.5% (259)
External company/organisation coming into my school	37.9% (332)	33.3% (5)	30.3% (44)	42.7% (163)	35.9% (120)
Formal learning through university/college course	24.8% (217)	13.3% (2)	22.1% (32)	24.6% (94)	26.6% (89)
Online learning	37.9% (332)	26.7% (4)	22.1% (32)	39.8% (152)	43.1% (144)
Online network of practitioners	49.2% (431)	53.3% (8)	38.6% (56)	45.5% (174)	57.8% (193)
Webinars	32.6% (286)	33.3% (5)	15.9% (23)	29.8% (114)	43.1% (144)
Attending local, regional and national events to share STEM ideas and practice	45.9% (402)	46.7% (7)	35.2% (51)	46.6% (178)	49.7% (166)
Attending open day visits to other schools/settings/organisations with interesting STEM practice	33% (289)	46.7% (7)	31.7% (46)	29.3% (112)	37.1% (124)
Professional reading/engaging independently with research	78.5% (688)	66.7% (10)	71.0% (103)	78.5% (300)	82.3% (275)
Social media – Twitter/Facebook etc	45.8% (401)	46.7% (7)	43.4% (63)	47.9% (183)	44.3% (148)
Other	15.9% (139)	26.7% (4)	8.9% (13)	19.6% (75)	14.1% (47)

Table 9: Types of professional learning accessed by sector

Note: ■ Indicates top 3 responses

Which organisation(s) provided you with professional learning?

In the 2017 survey, 23.2% (183) respondents indicated that they had accessed professional learning through their local authority. This compared with 49.2% (431) respondents in the 2018 survey. The shift in responses may be due to a larger proportion of responses from the primary and early learning and childcare sectors in the 2018 survey.

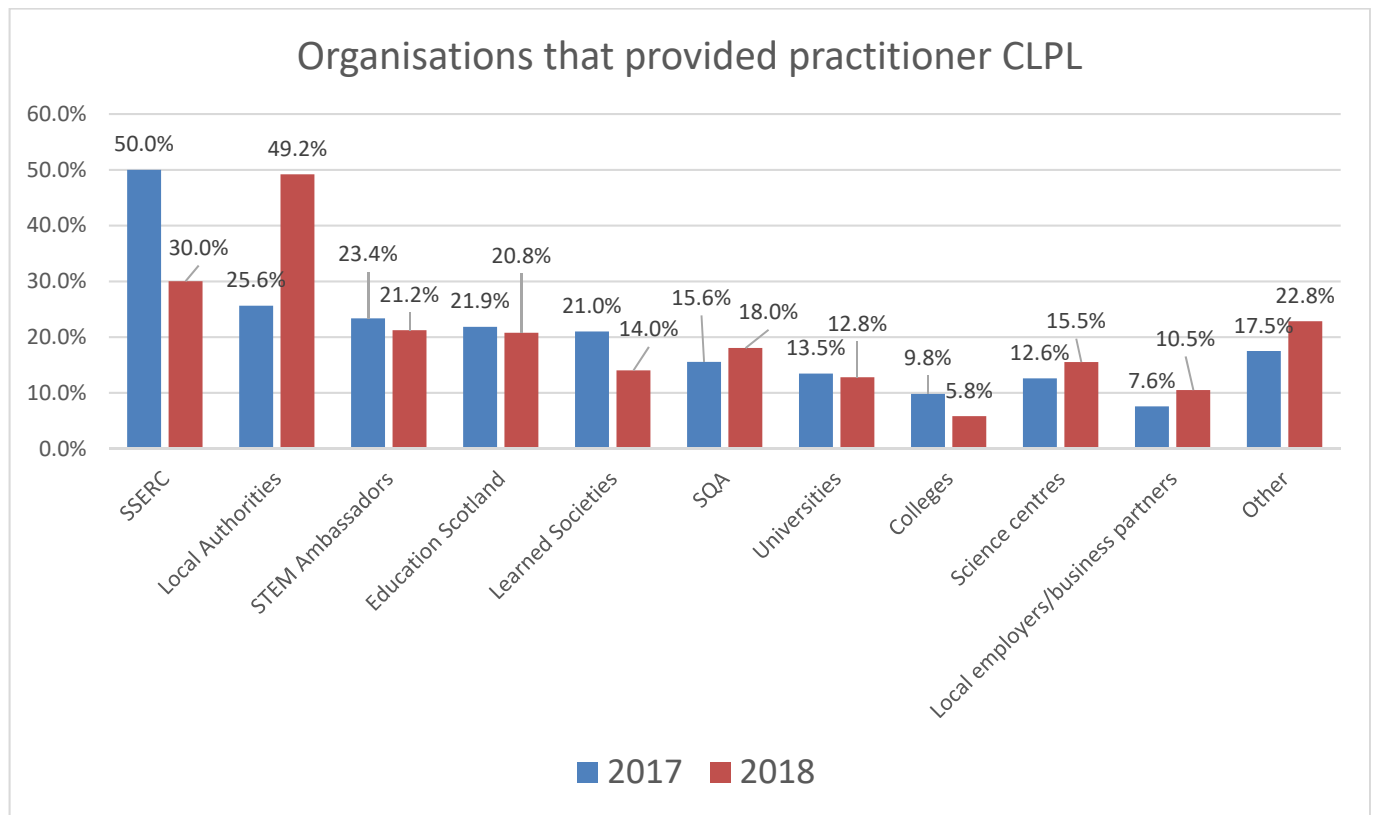


Figure 4: Percentage of organisations providing practitioner CLPL by sector

Organisation providing CLPL	Total response %	Response %			
		Additional Support Needs	Early learning and childcare	Primary	Secondary
SSERC	30.0% (263)	6.7% (1)	7.6% (11)	33.5% (128)	36.8% (123)
Local authority	49.2% (431)	33.3% (5)	64.1% (93)	55.0% (210)	36.8% (123)
STEM Ambassadors	21.2% (186)	26.7% (4)	13.8% (20)	27.2% (104)	17.4% (58)
Education Scotland	20.8% (182)	6.7% (1)	21.4% (31)	19.4% (74)	22.8% (76)
Learned societies	14.0% (123)	6.7% (1)	0% (0)	9.2% (35)	26.0% (87)
SQA	18.0% (158)	6.7% (1)	2.8% (4)	0.3% (1)	45.5% (152)
Universities	12.8% (112)	6.7% (1)	3.4% (5)	9.2% (35)	21.3% (71)
Colleges	5.8% (51)	0% (0)	4.8% (7)	5.0% (19)	7.5% (25)
Science centres/Festivals	15.5% (136)	13.3% (2)	5.5% (8)	18.6% (71)	16.5% (55)
Local employers/businesses	10.5% (92)	20% (3)	6.9% (10)	10.2% (39)	12.0% (40)
Other	22.8% (200)	Multiple responses			
Total response count	876	N/A			

Table 10: Organisations that provided practitioner CLPL by sector

Note: ■ Indicates top 3 responses

How easy has it been for you to access professional learning in STEM?

In the 2018 survey, 38.6% of secondary sector respondents (129 responses) indicated that it is difficult and/or very difficult to access CLPL.

Sector	Response count	% Response (Number of responses)				
		Very difficult	Difficult	Cannot say	Easy	Very easy
Additional support needs	15	13.33% (2)	20% (3)	66.67% (10)	0% (0)	0% (0)
Early learning and childcare	145	13.10% (19)	20% (29)	44.83% (65)	21.38% (31)	0.69% (1)
Primary	382	3.14% (12)	15.97% (61)	43.98% (168)	29.58% (113)	7.33% (28)
Secondary	334	11.98% (40)	26.65% (89)	34.43% (115)	22.16% (74)	4.79% (16)

Table 11: How easy has it been to access professional learning in STEM?

Was there sufficient choice and variety in STEM professional learning on offer to you?

Across all sectors, 36.4% (319 responses) of respondents answered 'No' or 'Definitely not' to the question, 'Was there sufficient choice and variety in STEM professional learning on offer to you?'

Sector	Response count	% Response (Number of responses)				
		Definitely not	No	Cannot say either way	Yes	Definitely
Additional support needs	15	20% (3)	26.67% (4)	46.67% (7)	6.67% (1)	0% (0)
Early learning and childcare	145	10.34% (15)	26.21% (38)	41.38% (60)	21.38% (31)	0.69% (1)
Primary	382	6.81% (26)	24.08% (92)	36.13% (138)	28.79% (110)	4.19% (16)
Secondary	334	12.87% (43)	29.34% (98)	29.64% (99)	22.75% (76)	5.39% (18)

Table 12: Was there sufficient choice and variety of STEM professional learning?

Main barriers to accessing professional learning in STEM

The 2018 practitioner survey highlighted the following barriers to accessing professional learning in STEM:

Barriers to accessing CLPL in STEM	Response % (Response count)
Difficulty finding staff cover	54.34% (476)
Difficulty in attending professional learning due to other commitments	40.53% (355)
Lack of funding to pay for professional learning	38.01% (333)
There is no suitable professional learning available	17.81% (156)
Location of my centre/school/organisation	14.04% (123)
I don't know where to get information about professional learning	13.47% (118)
Lack of support within my centre/school/organisation	10.62% (93)
Other	18.04% (158)

Table 13: Main barriers to accessing STEM professional learning

Note: ■ Indicates top 3 responses

In the 2017 practitioner survey, the question relating to barriers to CLPL was structured slightly differently so drawing a direct comparison with the 2018 data is not straightforward. However, in the 2017 survey, the top three barriers to accessing professional were identified as follows:

1. I have too many demands on my time – 55% of respondents listed this as a *significant* or *very significant* factor
2. Lack of money for training – 53% of respondents listed this as *significant* or *very significant* factor
3. Finding staff cover – 52% of respondents listed this as *significant* or *very significant* factor.

Barriers to accessing CLPL in STEM	Total Response % (Response count) (876)	Response % (Response count)			
		Additional support needs (15)	Early learning and childcare (145)	Primary (382)	Secondary (334)
Difficulty finding staff cover	54.34% (476)	53.3% (8)	33.8% (49)	53.7% (205)	64.1% (214)
Difficulty in attending professional learning due to other commitments	40.53% (355)	40.0% (6)	26.2% (38)	45.3% (173)	41.3% (138)
Lack of funding to pay for professional learning	38.01% (333)	20.0% (3)	22.8% (33)	32.2% (123)	52.1% (174)
There is no suitable professional learning available	17.81% (156)	46.7% (7)	30.3% (44)	13.1% (50)	16.5% (55)
Location of my centre/school/organisation	14.04% (123)	6.7% (1)	4.1% (6)	12.8% (49)	20.1% (67)
I don't know where to get information about professional learning	13.47% (118)	26.7% (4)	15.9% (23)	11.5% (44)	14.1% (47)
Lack of support within my centre/school/organisation	10.62% (93)	13.3% (2)	6.2% (9)	6.5% (25)	17.1% (57)
Other	18.04% (158)	Some comments listed in <i>Priorities and challenges</i> section			

Table 14: Main barriers to accessing STEM professional learning by sector

What are your STEM professional learning priorities for this academic year (1 August 2018 – 31 July 2019)?

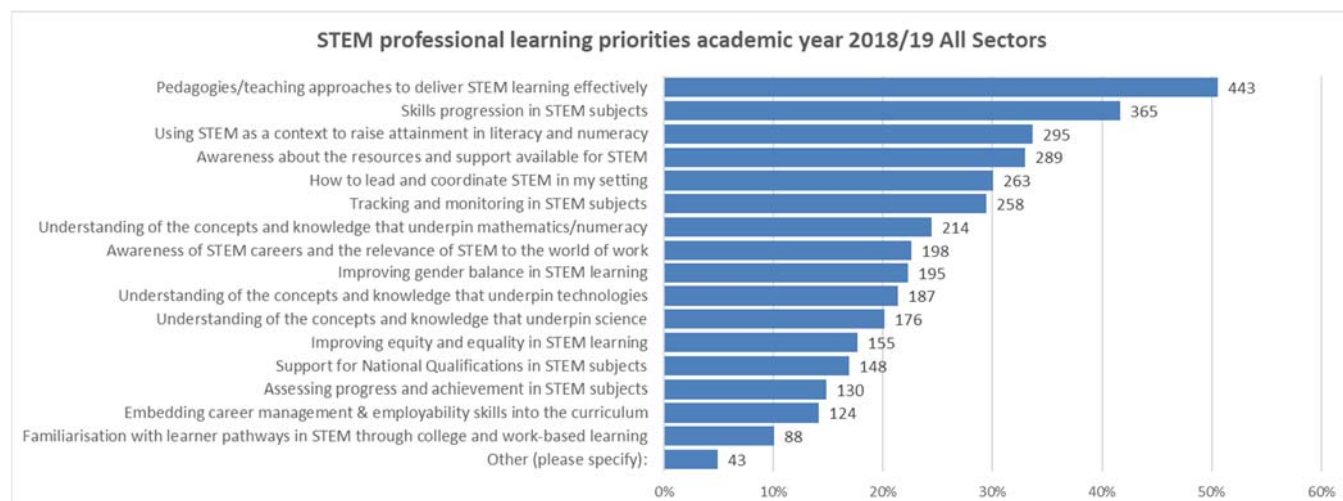


Figure 5: STEM professional learning priorities all sectors

The top three priorities by sector for 2018/19 are:

Sector	Top three STEM learning priorities for academic year 2018/19	Response % (Response count)
Additional support needs	<ul style="list-style-type: none"> Awareness about the resources and support available for STEM Pedagogies/teaching approaches to deliver STEM learning effectively Improving equity and equality in STEM learning 	67% (10) 47% (7) 40% (6)
Early learning and childcare	<ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Understanding the concepts and knowledge that underpin mathematics/numeracy Awareness about the resources and support available for STEM 	57% (82) 34% (49) 32% (47)
Primary	<ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Skills progression in STEM subjects (49% - 189 responses) Awareness about the resources and support available for STEM 	53% (204) 49% (189) 41% (146)
Secondary	<ul style="list-style-type: none"> Pedagogies/teaching approaches to deliver STEM learning effectively Support for National Qualifications in STEM subjects Skills progression in STEM subjects 	45% (150) 42% (139) 40% (133)

Table 15: Top 3 STEM professional learning priorities by sector

- **Pedagogies/teaching approaches to deliver STEM learning effectively** is one of the top three responses across all sectors.
- **Awareness about the resources and support for STEM** is important across early learning and childcare, primary and additional support needs sectors.
- **Skills progression in STEM subjects** is one of the top three priorities for both primary and secondary sectors.
- **Support for National Qualifications in STEM subjects** is important for secondary sector practitioners.

STEM professional learning priorities for academic year 2018/19	Total response % (Response count) (876)	Response % (Response count)			
		Additional Support Needs (15)	Early learning and childcare (145)	Primary (382)	Secondary (334)
Pedagogies/teaching approaches to deliver STEM learning effectively	50.6% (443)	46.7% (7)	56.6% (82)	53.4% (204)	44.91% (150)
Understanding of the concepts and knowledge that underpin mathematics/numeracy	24.4% (214)	26.7% (4)	33.8% (49)	34.0% (130)	9.3% (31)
Understanding of the concepts and knowledge that underpin science	20.1% (176)	20.0% (3)	20.0% (29)	23.6% (90)	16.2% (54)
Understanding of the concepts and knowledge that underpin technologies	21.3% (187)	13.3% (2)	20.0% (29)	28.0% (107)	14.7% (49)
How to lead and coordinate STEM in my setting	30.02% (263)	40.0% (6)	29.7% (43)	32.5% (124)	26.9% (90)
Using STEM as a context to raise attainment in literacy and numeracy	33.7% (295)	40.0% (6)	29.7% (43)	40.1% (153)	27.8% (93)
Skills progression in STEM subjects	43.9% (385)	33.3% (5)	26.2% (38)	49.5% (189)	39.8% (133)
Tracking and monitoring in STEM subjects	29.5% (258)	13.3% (2)	20.0% (29)	35.1% (134)	27.8% (93)
Awareness about the resources and support available for STEM	33.0% (289)	66.7% (10)	32.4% (47)	40.8% (156)	22.8% (76)
Improving gender balance in STEM learning	22.3% (195)	33.3% (5)	11.7% (17)	16.0% (61)	33.5% (112)
Improving equity and equality in STEM learning	17.7% (155)	40.0% (6)	12.4% (18)	14.9% (57)	22.2% (74)
Support for National Qualifications in STEM subjects	16.9% (148)	20.0% (3)	2.1% (3)	0.8% (3)	41.6% (139)
Assessing progress and achievement in STEM subjects	14.8% (130)	20.0% (3)	6.9% (10)	16.8% (64)	15.9% (53)
Awareness of STEM careers and the relevance of STEM to the world of work	22.6% (198)	26.7% (4)	5.5% (8)	18.9% (72)	34.1% (114)
Embedding career management & employability skills into the curriculum	14.2% (124)	6.7% (1)	2.1% (3)	10.2% (39)	24.3% (81)
Familiarisation with learner pathways in STEM through college and work-based learning	10.1% (88)	20.0% (3)	6.9% (10)	6.3% (24)	15.3% (51)
Other	4.9% (43)	20.0% (3)	5.5% (8)	6.5% (25)	9.0% (30)

Table 16: STEM Professional learning priorities for academic year 2018/19 by sector

Note: ■ Indicates top 3 responses

How can we improve CLPL in STEM to meet the needs of practitioners?

Type of CLPL	Total response % (Response count) (876)	Response % (Response count)			
		Additional support needs (15)	Early learning and childcare (145)	Primary (382)	Secondary (334)
More face-to face professional learning opportunities	59.82% (524)	53.33% (8)	57.24% (83)	59.69% (228)	61.38% (205)
More online professional learning opportunities	41.32% (362)	60.00% (9)	51.72% (75)	40.05% (153)	37.43% (125)
More opportunities to engage/collaborate with other STEM practitioners	53.31% (467)	53.33% (8)	48.28% (70)	55.76% (213)	52.69% (176)
More STEM exemplification/case studies	32.19% (282)	40.00% (6)	20.69% (30)	31.68% (121)	37.43% (125)
More simplified and play-based learning options	43.88% (380)	60.00% (9)	70.43% (102)	58.90% (225)	13.17% (44)
More opportunities to visit other settings/ organisations	40.98% (359)	53.33% (8)	40.00% (58)	41.36% (158)	40.42% (135)
Other	11.99% (105)	20.00% (3)	4.14% (6)	6.81% (26)	16.77% (56)

Table 17: How can we improve STEM professional learning?

Note: ■ Indicates top 3 responses

- **More face-to-face and professional learning opportunities and also engagement/collaboration with other STEM professionals** are the top responses from practitioners.
- For those responding to the “Other” section, the top three responses cited more time, funding and resources as being important.

Section C – STEM in your practice

Practitioner confidence

The following table details the practitioner responses to the statement 'I feel confident delivering STEM learning in my practice.'

Some 63.4% (556 responses) of practitioners **agreed** or **strongly agreed** with this statement. It is worth noting that although the practitioner survey was open to all practitioners, it is more likely that the survey was completed by those with an interest or high level of engagement in STEM learning. The levels of confidence expressed, therefore, are likely to reflect this. As a result, the levels of confidence from early learning and childcare, ASN and primary sector respondents may be higher than in the general practitioner workforce.

Sector	Total number of responses	% of responses per sector (Number of responses)		
		Agree	Strongly agree	Total
Additional support needs	15	40.0% (6)	6.7% (1)	46.7% (7)
Early learning and childcare	145	37.9% (55)	4.8% (7)	42.8% (62)
Primary	382	49.5% (189)	13.9% (53)	63.4% (242)
Secondary	334	41.9% (140)	31.4% (105)	73.4% (245)

Table 18: Practitioner confidence by sector

What impact did your STEM professional learning have on your learners, their parents/carers and the wider community?

Statement	% of responses (Number of responses) (876)					
	No evidence	Little evidence	Some evidence	Good evidence	Very strong evidence	Cannot say
Attainment in STEM increased	9.0% (79)	8.4% (74)	29.3% (257)	18.4% (161)	4.6% (40)	30.3% (265)
Attainment in literacy and numeracy was raised amongst my learners	9.9% (87)	12.8% (112)	25.9% (227)	14.5% (127)	2.4% (21)	34.5% (302)
Attainment increased across other curricular areas	11.4% (100)	12.3% (108)	22.0% (193)	10.3% (90)	2.2% (19)	41.8% (366)
My learners` confidence in STEM grew	6.2% (54)	8.1% (71)	28.0% (245)	24.9% (218)	10.7% (94)	22.1% (194)
My learners` confidence grew in general	6.7% (59)	6.8% (60)	27.7% (243)	24.7% (216)	8.3% (73)	25.7% (225)
My learners developed new skills for learning, life and work	5.7% (50)	8.3% (73)	25.1% (220)	29.5% (258)	10.3% (90)	21.1% (185)
My learners were more motivated to learn about STEM	5.8% (51)	6.8% (60)	22.1% (194)	28.2% (247)	14.5% (127)	22.5% (197)
My learners were more motivated to learn in general	7.1% (62)	7.2% (63)	27.3% (239)	24.0% (210)	8.1% (71)	26.4% (231)
My learners had more awareness of STEM careers and the relevance of STEM to the world of work	8.8% (77)	11.1% (97)	23.3% (204)	22.3% (195)	9.8% (86)	24.8% (217)
My learners were more motivated to pursue a career in STEM	10.3% (90)	11.8% (103)	22.7% (199)	14.6% (128)	5.4% (47)	35.3% (309)
My learners were more confident in addressing issues relating to gender balance and in challenging stereotypes	15.2% (133)	13.1% (115)	19.4% (170)	12.3% (108)	3.7% (32)	36.3% (318)
My learners were more confident in addressing issues relating to inequalities and inequity	16.4% (144)	13.6% (119)	19.2% (168)	10.7% (94)	2.7% (24)	37.3% (327)
Families, parents/carers and the wider community were more aware of and engaged in STEM	15.4% (135)	14.7% (129)	21.5% (188)	11.0% (96)	5.9% (52)	31.5% (276)

Table 19: What impact did STEM professional learning have on learners, parents/carers and the wider community

The data shows that practitioners have some evidence of improvement in terms of learner confidence, motivation and development of skills.

Section D – STEM in your setting

STEM within school/setting

Question	Responses key points
Did STEM feature in your school or setting improvement plan during this period?	42% (364 responses) confirmed that STEM features in their school/setting improvement plan. A further 9% (77 responses) stated that this would be included in session 2018/19).
Did your school or setting engage with the Education Scotland's STEM self-evaluation and improvement framework during this period?	21% (180 responses) confirmed that their school/setting engaged with Education Scotland's STEM self-evaluation framework.
Did you have a STEM co-ordinator/s in your school/setting during this period?	40% (350 responses) confirmed that their school/setting has a STEM co-ordinator. A further 5% (41 responses) stated that this would be included in session 2018/19).
Did your school/setting provide leadership opportunities for young people in STEM (e.g. STEM leaders/STEM captains etc) during this period?	29% (256 responses) confirmed that their school/setting provides leadership opportunities in STEM.
Did your school/setting work collegiately across your associated school group/cluster to jointly plan the STEM curriculum and ensure effective progression in learning during this period?	25% (215 responses) confirmed that their school/setting works collegiately across its cluster.
Did STEM feature in your associated school/group cluster improvement plan during this period?	23% (202 responses) confirmed that STEM features in their group/cluster improvement plan. A further 3% (25 responses) stated that this would be included in session 2018/19).
Did your setting or organisation have a STEM partner, or partners, from the private, public or third sector during this period?	26% (227 responses) confirmed that their setting had a STEM partner.

Table 20: STEM within school/setting

Did your setting or organisation have a STEM partner or partners?

The proportion of responders' which said their establishment had a STEM partner(s) from the private, public or third sector in 2017/18 is 25.9% (227 responses).

Did your setting or organisation have a STEM partner or partners?	% of responses (Number of responses)
Yes	25.9% (227)
No	30.5% (267)
Don't know	39.8% (349)
Not in 2017/18, but yes for session 2018/19	2.6% (23)
Not in 2017/18, but yes for next session 2019/20	1.1% (10)

Table 21: Did your setting or organisation have a STEM partner(s)?

Sector	% Response (Number of responses)				
	Yes	No	Don't know	Not in 2017/18 but yes in 2018/19	Not in 2017/18 but yes in 2019/20
Additional support needs (15)	26.7% (4)	46.7% (7)	26.7% (4)	0% (0)	0% (0)
Early learning and childcare (145)	11.7% (17)	37.2% (54)	48.9% (71)	2.1% (3)	0% (0)
Primary (382)	25.9% (99)	37.4% (143)	32.5% (124)	2.9% (11)	1.3% (5)
Secondary (334)	32.0% (107)	18.9% (63)	44.9% (150)	2.7% (9)	1.5% (5)

Table 22: Practitioner knowledge of STEM partner(s) by sector

How did you find out about these partner organisations?

The top three ways in which practitioners found out about partner organisations are: STEM ambassadors, personal contact and through parent/carers.

How did you find out about partner organisations?	Total Response % (Response count) (876)	Response % (Response count)			
		Additional support needs (15)	Early learning and childcare (145)	Primary (382)	Secondary (334)
Approached directly by partner	7.1% (62)	6.7% (1)	2.8% (4)	6.0% (23)	10.2% (34)
Via a STEM provider organisation	7.9% (69)	0% (0)	2.1% (3)	9.7% (37)	8.7% (29)
Developing Young Workforce Regional Group	8.1% (71)	13.3% (2)	2.1% (3)	5.2% (20)	13.8% (46)
College/university	9.6% (84)	6.7% (1)	2.1% (3)	7.9% (30)	15.0% (50)
Parent/Carer	9.9% (87)	0% (0)	5.5% (8)	13.6% (52)	8.1% (27)
Personal contact	15.3% (134)	13.3% (2)	6.9% (10)	13.1% (50)	21.6% (72)
STEM Ambassadors	15.4% (135)	13.3% (2)	7.6% (11)	18.3% (70)	15.6% (52)
Other	16.2% (142)	53.3% (8)	62.3% (91)	47.6% (182)	46.7% (156)
Not sure	49.9% (437)	Multiple responses			

Table 23: How did your school/setting find out about these STEM partners?

What impact did these partnerships have on your school/setting during this period?

Sector	% of responses (Number of responses)					
	No positive impact	Little	Some	High	Very high positive impact	Cannot say
Attainment in STEM learning was raised amongst my learners	2.3% (20)	5.1% (45)	17.2% (151)	8.9% (78)	4.1% (36)	62.3% (546)
My learners gained in confidence as a result of the opportunities provided to achieve personally in STEM	1.7% (15)	4.5% (39)	20.5% (180)	12.1% (106)	4.6% (40)	56.6% (496)
My learners developed new skills for learning, life and work	1.8% (16)	4.0% (35)	20.1% (176)	14.2% (124)	4.8% (42)	55.1% (483)
Attainment in literacy and numeracy was raised amongst my learners	2.6% (23)	7.2% (63)	17.2% (151)	8.0% (70)	1.8% (16)	63.1% (553)
My learners were more motivated to learn about STEM	2.2% (19)	4.2% (37)	16.3% (143)	16.9% (148)	5.7% (50)	54.7% (479)
My learners were more motivated to learn in general	2.1% (18)	4.8% (42)	17.0% (149)	14.7% (129)	2.6% (23)	58.8% (515)
My learners had more awareness of STEM careers and the relevance of STEM to the world of work	2.4% (21)	4.3% (38)	15.5% (136)	16.6% (145)	5.1% (45)	56.1% (491)
My learners were more motivated to pursue a career in STEM	2.5% (22)	5.3% (46)	16.4% (144)	10.7% (94)	3.5% (31)	61.5% (539)
My learners were more confident in addressing issues relating to gender balance and in challenging stereotypes	4.5% (39)	6.2% (54)	14.4% (126)	7.8% (68)	2.4% (21)	64.8% (568)
My learners were more confident in addressing issues relating to inequalities and inequity	4.9% (43)	6.4% (56)	15.1% (132)	6.1% (53)	1.4% (12)	66.2% (580)
Families, parents/carers and the wider community were more aware of and engaged in STEM	4.7% (41)	6.5% (57)	16.6% (145)	7.3% (64)	3.2% (28)	61.8% (541)

Table 24: What impact did these STEM Partners have on your school/setting?

Data indicates that the majority of practitioners 'cannot say' if partnership(s) have any impact within the school/setting.

Priorities and challenges

How can we improve professional learning in STEM to better meet practitioners needs?

Practitioners provided the following comments by way of response to this question:

Additional support needs

- More support is needed for practitioners in ASN schools including those supporting children and young people with complex learning needs.

Early learning and childcare

- Early learning and childcare to be included in CLPL opportunities
- More learning community based opportunities for early years through to secondary to work collaboratively.

Primary

- Time, funding and staff cover to access CLPL
- Online access to resources and CLPL
- Collegiate working
- Inconsistency of CLPL offer across Scotland
- RAiSE team to continue.

Secondary

- Time, funding and staff cover to access CLPL
- More opportunities for collaboration especially across clusters
- Reduce workload
- Online access to resources and CLPL
- Inconsistency of CLPL offer across Scotland
- Raising awareness of STEM subjects to the school wider community
- Industry contacts to raise awareness of STEM.

What are the main barriers to accessing professional learning?

Additional support needs

- Finding support for learning and teaching with ASN secondary pupils is a challenge due to the nature of pupils` needs.

Early learning and childcare

- Time constraints – nursery staff work 8am until 6pm so difficult to arrange staff cover
- STEM not currently a priority
- Courses are always full
- STEM CLPL on offer applied to older learners.

Primary

- Time, funding and staff cover to access CLPL
- Workload commitments
- Other priorities within school

- Inconsistency of CLPL offer across Scotland
- Limited CLPL within locality.

Secondary

- Time, funding and staff cover to access CLPL
- Funding for travel especially in rural communities
- Workload commitments
- Lack of perceived relevance to school context
- Awareness that STEM CLPL is for all teachers.

Progress to date

Since the publication of the STEM Education and Training Strategy in October 2017, Education Scotland has worked with partners to put in place the resources and structures to support implementation of actions relating to career-long professional learning. The points below outline the key achievements to date.

Regional STEM Advisors – Education Scotland has now recruited a new team of Regional STEM Advisors. The new team will play a lead role in coordinating and leading the provision of STEM CLPL regionally, in line with local contexts and needs. They will also play an important role in supporting strong regional partnerships.

College STEM Hubs – College STEM hubs have now been established across all thirteen college regions. The STEM Hubs will facilitate the development of regional STEM strategies to progress the aims and aspirations of the STEM Strategy. They will have a key role to play in supporting professional learning and creating opportunities for practitioners and technicians to meet STEM employers and learn about STEM-related pathways and careers. They will also strengthen collaboration between partners including universities, science centres and employers.

Improving Gender Balance and Equalities – Following a successful three-year pilot, the learning from the Improving Gender Balance Programme is now being extended to all school clusters in Scotland. Education Scotland has recruited a new team to lead and support this work. The new team will play a key role in tackling stereotypes and unconscious bias that have affected uptake and pathways in STEM, as well as other areas.

Partnership discussions – Education Scotland has been meeting with a wide range of partners to discuss opportunities for partnership working to enhance and extend provision of professional learning in STEM. This includes: science centres and festivals, the Learned Societies Group, colleges, Skills Development Scotland, Scottish College of Educational Leadership, SQA, Science Skills Academy, the Deans of Science and Engineering and other higher education groups and research pools.

RAiSE – The Raising Aspirations in Science Education (RAiSE) Pilot Programme is led by Education Scotland, and funded by the Wood Foundation, Scottish Government and participating local authorities. The programme, initially involving eight local authorities, has now been extended to a further four authorities located across Scotland. Each participating authority receives grant funding to recruit a dedicated Primary Science Development Officer to lead and coordinate professional learning support to practitioners, with a strong focus on building capacity in primary schools. There are now in place in the eight participating local authorities. The final evaluation of the pilot programme will be published in May 2018 and will inform the decision as to whether the programme is rolled-out to all remaining local authorities.

Scottish Learning Festival – SLF 2018 had a strong focus on STEM with a variety of stimulating seminars and exhibitors on offer. This included an all-new STEM live event in which delegates had the chance to engage with fantastic STEM keynotes and action-packed demonstration sessions.

Grants Programme – Education Scotland launched a new ‘Enhancing Professional Learning in STEM’ Grants Programme in October 2018. In the first round of funding, £187K was awarded to 24 projects to support regional and national professional learning programmes. These exciting opportunities are being developed by a range of partners to build the capacity and confidence of practitioners across a range of sectors; including early learning and childcare, primary, secondary, community learning and development and school-based technical support staff. Education Scotland will launch a second round of grant funding in May 2019 with exciting potential for school clusters and practitioner networks.

SSERC – Scottish Government has confirmed a grant of £860,000 for SSERC in financial year 2018/19. In addition, SSERC has been awarded a further £62,760 to support the development of their digital skills programme. SSERC is now establishing SSERC-accredited centres to provide more localised support to school technicians and technology teachers.

Conversation days – A series of conversation days with practitioners from all sectors have been scheduled to run from January to May 2019. These days help practitioners understand the links between the STEM Education and Training Strategy, family learning and parental engagement and have provided a platform for sharing good practice in STEM learning.

Network days – Education Scotland organised a national networking event for community learning and development (CLD) leads and practitioners in February 2019. The aim of the event was to raise the profile and engagement of CLD practitioners in STEM learning and to promote effective resources and practice. A STEM Leads Network event also took place in March 2019 to engage key local authority STEM coordinators and STEM providers and to share plans for the next stage of implementation of the STEM Education and Training Strategy.

You said, we did

The insights afforded by the initial practitioner survey in 2017 were invaluable in terms of highlighting the professional STEM learning needs of practitioners across Scotland. The summary table below outlines some of the key issues and challenges highlighted in the survey and how Education Scotland and partners have begun to address the issues raised.

You said	We did
General	
<ul style="list-style-type: none"> Professional learning must be accessible to all at all levels Make it quick and easy for practitioners to find suitable professional learning. 	<ul style="list-style-type: none"> The Enhancing Professional Learning in STEM grants programme has funded 24 projects supporting sectors including early learning and childcare, primary, secondary, technicians and CLD sectors. Education Scotland is currently developing an online resource to make it as easy as possible for practitioners to find CLPL that meets their needs.
Support for STEM in settings, clusters and local authorities	
<ul style="list-style-type: none"> We need teacher advisors in school to support teaching, building confidence of practitioners, provide advice and guidance. Each school should have a STEM coordinator who works with other coordinators in a cluster. There should be more support and professional learning for early learning & childcare and primary teachers. Provision funding and opportunities for teachers to engage in action learning and professional enquiry to develop their pedagogies in their own their own contexts. More collegiate and networking time should be available. We need someone to coordinate activities at local authority level. 	<ul style="list-style-type: none"> Education Scotland's Enhancing Professional Learning in STEM Grants Programme has a strong focus on providing support for STEM within settings, clusters and to build leadership and coordination capacity at local authority level. Round 2 of grant funding will provide resources to support practitioner enquiry and collaborative working. SSERC's Primary Cluster Programme has been funded by Scottish Government for over six years. Practitioners are trained as science mentors to provide support in their clusters. The programme has reached every authority and is now being extended to new clusters. SSERC are now extending their CLPL to increase provision for ELC practitioners. The RAISE programme provides local authorities with additional capacity for STEM. RAiSE Officers have been helping to build leadership capacity for STEM in schools and clusters, including in early learning and childcare settings and primary schools. Education Scotland has recruited new regional STEM Advisors and Improving Gender Balance and Equalities officers to further support early learning and childcare settings, schools, clusters and local authorities.

You said	We did
Online resources and professional learning	
<ul style="list-style-type: none"> • More professional online resources • Central resources • One-stop shop for STEM CLPL like Numeracy & Maths hub • CLPL online so it is available to everyone at any time and support virtual networking • Use Glow to its fullest to support professional learning – Glow meets, Yammer 	<ul style="list-style-type: none"> • New online learning opportunities are being developed through the Enhancing Professional Learning in STEM Grants Programme. • Scottish Government has commissioned a new online professional learning in STEM module for early learning and childcare practitioners. • Education Scotland’s new STEM-related teams will explore opportunities to support online professional learning, including through Skype and Glow meets and other platforms.
External training	
<ul style="list-style-type: none"> • More access to SSERC training – possibly in different locations. • Find ways for SSERC training to be accessed by ALL sector schools in Scotland – early learning and childcare, primary and secondary • We want frequently run courses, delivered locally. 	<ul style="list-style-type: none"> • SSERC has now launched an accredited training centre program for technicians to allow external bodies to apply to become licensed to run SSERC accredited courses in different locations throughout Scotland. • SSERC is also delivering technician-focussed courses in schools and authorities that have identified the need for local support. Sixteen external courses reaching 90 delegates have used this model between August 2018 and March 2019. • SSERC is now expanding its offer to include support for early learning and childcare and digital learning and teaching as well as professional learning delivered virtually. • Education Scotland’s STEM practitioner survey and provider survey is helping to track professional learning nationally to help identify geographical gaps in provision and to ensure equity of access.
Colleges & universities	
<ul style="list-style-type: none"> • Networking opportunities for teachers to make contact with colleges, universities and employers to develop local partnerships • Free taster courses at colleges 	<ul style="list-style-type: none"> • STEM Hubs have been established in all thirteen college regions to enhance STEM support and professional learning locally and to create opportunities for colleges, universities, practitioners and employers to collaborate. • Education Scotland has further supported the development of the college STEM Hub model by funding some innovative college activity through our new STEM CLPL Grants Programme.

You said	We did
Employers	
<ul style="list-style-type: none"> • Regular opportunities for teachers to spend time in industry to update their knowledge. • Opportunities for STEM Ambassadors to spend more time in schools. 	<ul style="list-style-type: none"> • Twenty one Developing Young Workforce Regional Groups have been established nationally to support employer and school engagement. Education Scotland’s new Regional Teams will be working closely with these groups to explore opportunities for enhancing professional learning opportunities in relation to STEM industries. • A core purpose of the college STEM Hub model is to create opportunities for practitioners, college staff and employers to engage with each other. The hubs will create opportunities for collaboration and to promote practitioner awareness of labour market information. • SSERC manage the contract for the STEM Ambassador Hubs in Scotland. In line with STEM Strategy commitments, the STEM Ambassador Hubs are exploring ways to increase the impact of STEM Ambassadors including promotion of the role they can play in supporting professional learning in STEM. Scottish Government has also awarded SSERC £500,000 to establish a new Young STEM Leaders Programme in Scotland.

Table 25: Comments from 2017 practitioner CLPL survey and the initiatives implemented by Education Scotland

Next steps

Under the theme of *Excellence*, the STEM Education and Training Strategy commits national agencies to a number of actions to enhance provision of career-long professional learning. In the second year of implementation of the Strategy, Education Scotland and partners will seek to build on the early momentum that has been established by taking forward the planned activity listed below.

- Education Scotland's Regional STEM, and also Mathematics and Numeracy Education Officers, will work with key partners through the Regional Improvement Collaboratives, helping to coordinate and support professional learning.
- There will be promotion and raising awareness of the links between outdoor learning and STEM subjects in the early learning and childcare sector, including the development, by Scottish Government, of an online professional learning module.
- Education Scotland's newly appointed Improving Gender Balance and Equalities Officers will deliver gender training to schools and teachers, and develop a gender ambassador network.
- A national STEM engagement campaign will be launched and implemented by Scottish Government.
- A Scottish STEM Award Programme will be piloted with an initial focus on early learning and childcare and schools to recognise and build on activities in these sectors.
- An online directory of quality assured STEM inspiration activities for schools will be developed by Education Scotland.
- Education Scotland will run the second annual community learning and development conference to showcase inspirational lifelong learning STEM practice.
- Education Scotland will publish a national thematic inspection report of numeracy and mathematics as part of a range of national thematic inspections.

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