Libraries & STEM Learning: Results from a Survey of Libraries Across the UK and Ireland

Keliann LaConte, Fulbright Global Scholar
Hosted by the University of Edinburgh

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Acknowledgements

A Fulbright Global Scholar project (2018-19) provided information on the state of STEM learning opportunities in libraries across the UK and Ireland.

Many individuals, across various sectors, were critical to conducting this research.

About the Fulbright Program

The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to increase mutual understanding between the people of the U.S. and the people of other countries. The views expressed during this research summary are entirely those of its author and do not represent the views of the Fulbright Program, the U.S. Department of State or any of its partner organizations.

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Research Hosted by University of Edinburgh

Special thanks to the University of Edinburgh for hosting this project, especially Dr Simon Kelley, Professor of Isotope Geochemistry and Head of the School of GeoSciences, for his collaboration on the development and implementation of this project.

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Ethics Considerations

The University of Edinburgh School of GeoSciences Research Ethics and Integrity Committee granted approval for this research on 24th July 2019.

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Reviewers

Thanks to the following individuals, who provided critical insights for the design of this research:

- Stuart Dunbar, Engagement Manager, College of Science and Engineering, The University of Edinburgh

- Ayub Khan, Business & Customer Services Manager at Warwickshire County Council and Immediate Past President of CILIP: The Library & Information Association

- Dr Claire McGuinness, Assistant Professor, Deputy Head of School, and Director of Undergraduate Programmes, School of Information and Communication Studies, University College Dublin

- An anonymous member of Libraries Connected
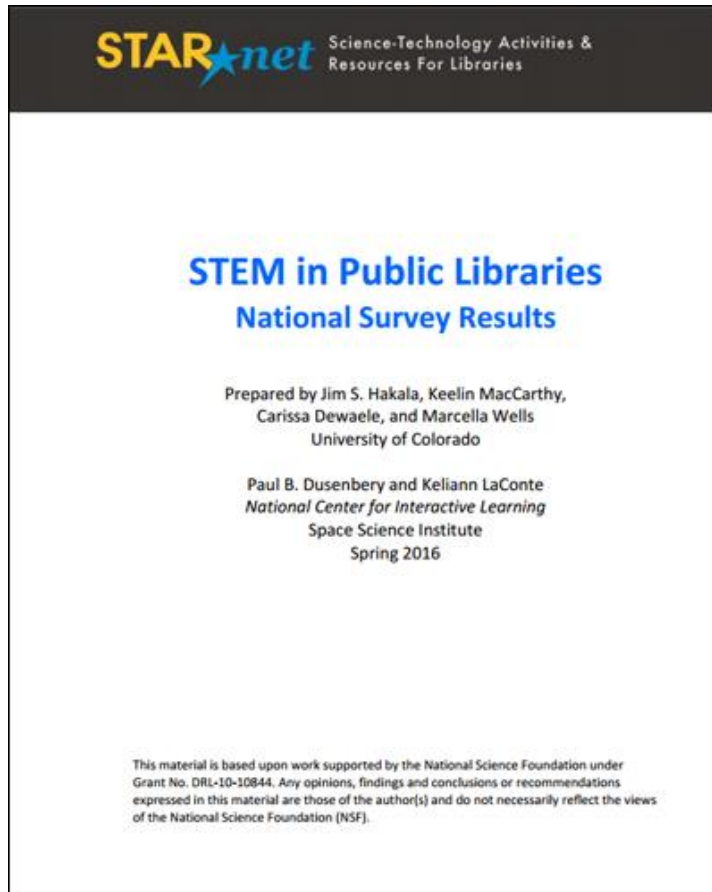
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Special Thanks

Thank you to the 102 individuals who participated in the survey, as well as 18 individuals who provided even more detailed information by participating in interviews. Your perspectives were essential for this research.

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International Insights: U.S. Libraries

Special thanks to Jim Hakala, Senior Educator at the University of Colorado Museum, and Dr Paul Dusenbery, Director of the National Center for Interactive Learning at the Space Science Institute, who provided permission to base this research on a survey of U.S. librarians.

Explore more about STEM learning in U.S. libraries through the STAR Library Network at www.starnetlibraries.org.

Hakala, Jim S., Keelin MacCarthy, Carissa Dewaele, Marcella Wells, Paul Dusenbery, and Keliann LaConte. 2016. "STEM in Public Libraries: National Survey Results." Boulder, CO: University of Colorado. Retrieved from www.nc4il.org/images/papers/FINAL_STEM_LibrarySurveyReport.pdf.

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International Insights: Australian Libraries

Research on STEM learning in Australian libraries was conducted in 2018. Access the results through the Australian Library and Information Association:

- 'Libraries & STEM Learning: Recommendations for Future Collaborations Based on a National Survey' in the May/June 2018 issue of *INCITE* magazine.
- Full research summary slide set

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Using This Research Summary

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For Libraries and Their (Potential) Collaborators

Please share these findings with others in your network.

Consider using this slide set to start a conversation with other organizations in your community, such as schools, universities, historic environment organisations, government agencies and industries.

Together, we can increase the public's access to innovative — and fun! — STEM learning experiences.

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Tailoring the Slides for Your Needs

- Detailed information about this research is presented as slides entitled 'Detailed Notes'.

- 'Detailed Notes' slides are intended to provide background information and should not be used during presentations.

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Research Details

Study Purpose

The purpose was to determine:

- What STEM-rich learning experiences are currently in place in libraries? How do libraries approach and implement these events and services?

- What obstacles prevent libraries from incorporating more STEM events?

- What kind of training and resources would be most helpful to librarians?

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Detailed Notes: Research Methods

The researcher employed a mixed-method approach, collecting qualitative data from semi-structured interviews, and qualitative and quantitative data from anonymous surveys with library staff from August - December 2019. Members of UK and Ireland library professional networks reviewed the existing survey instrument and phone interview instrument to ensure that useful information would be collected and that the questions were clear from a cultural and linguistic perspective. The survey was administered (following ethics review) through the University of Edinburgh's online survey system (Qualtrics). A convenience sample method was used to collect responses on a voluntary basis. The survey was designed to take 15-20 minutes to complete. Telephone interviews were conducted with respondents who provided contact information on the surveys, and several library staff participated in in-person interviews. Qualitative data was annotated, coded, and summarized.

Public Libraries & STEM

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Research Highlights

The majority of research participants work in public libraries.

This section draws on their input to highlight how STEM learning is being offered by public libraries in various communities across the UK and Ireland.

Public Library Participants

- 89 survey respondents
- 17 interviewees
- Jurisdictions: England, Scotland, Northern Ireland, the Isle of Man, and Ireland

STEM and Digital Literacy Priorities

STEM learning is a technical literacy for today's citizens to complement the information, digital and reading literacy skills built by public libraries for children, families, adults and hard to reach groups.

– Survey respondent

Most Respondents Offer STEM
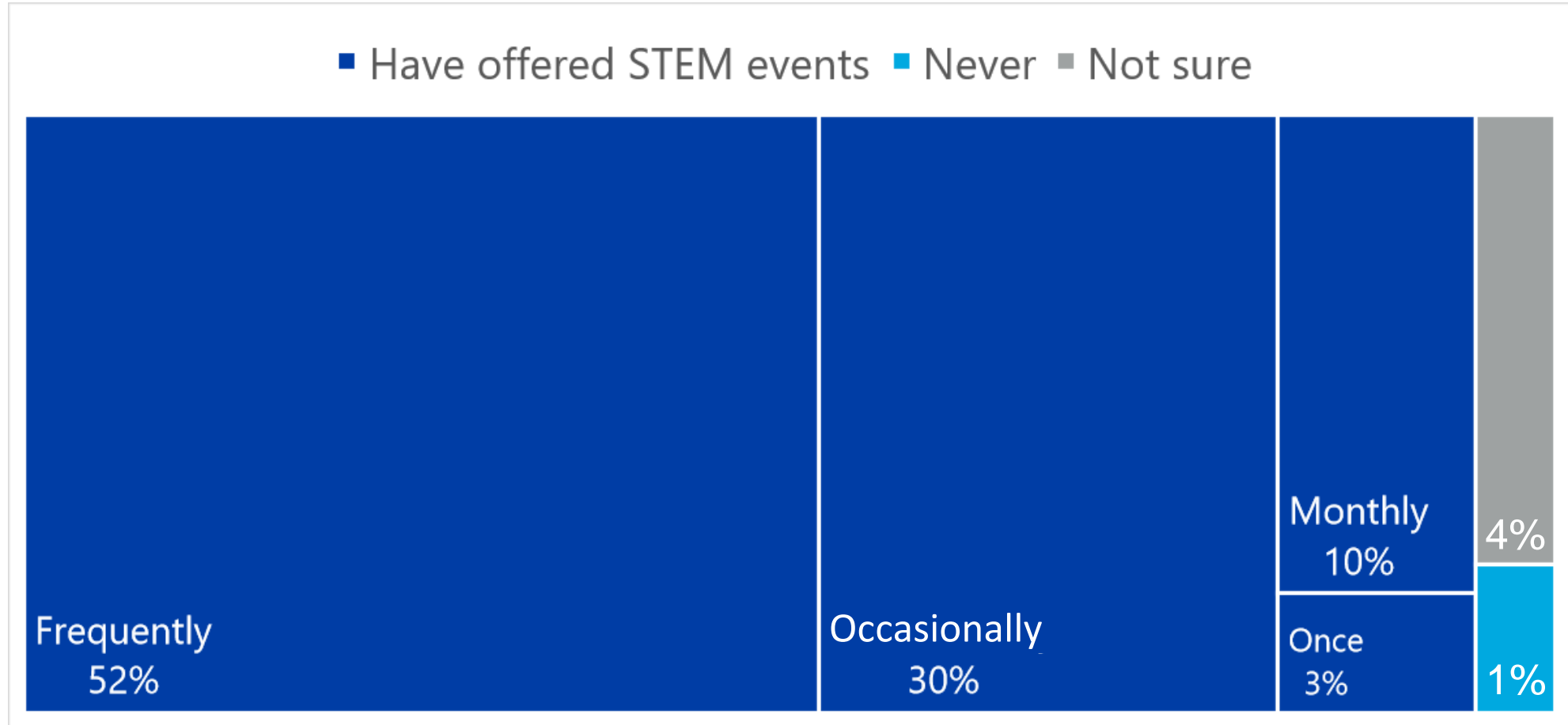
Have offered STEM events ■ Never ■ Not sure

Frequently
52%

Occasionally
30%

Monthly
10%

Once
3%

4%

1%

Percentages are out of 76 responses

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Detailed Notes: Most Respondents Offer STEM

Of 77 responding library staff, the majority (95%) have offered STEM events.

Over half of respondents (52%) offer STEM frequently, but some also offer STEM events monthly (10%) or occasionally (3-4 times per year) (30%) and 3% have offered them once. A few respondents were not sure. Only one respondent had never offered STEM.

Current Ages Targeted

The top three audiences currently targeted for STEM events are:

1. Ages 9-12 (87%)

2. Ages 6-8 (71%)

3. Ages 13-17 (50%)

Percentages are out of 84 responses
Respondents could select multiple options

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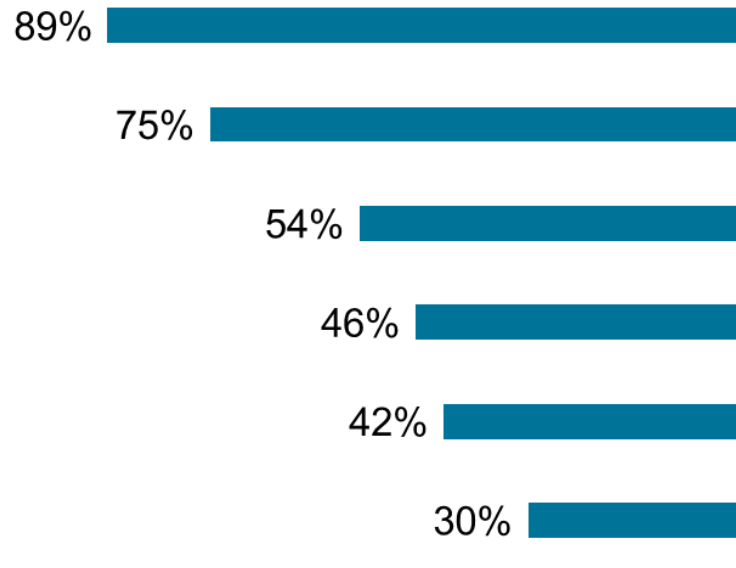# STEM Activities Are *Fun*

STEM learning in libraries is different to schools as it is more informal and fun. Everyone can explore further in different directions wherever their interest takes them.

[STEM events] should be enjoyable, fun and provide a sense of achievement and where possible bring people together to learn collaboratively

– Survey respondents

Current/Future STEM Learning

Current STEM-rich learning experiences

89%	
75%	
54%	
46%	
42%	
30%	

Percentages are out of 76 responses

Future STEM events and services
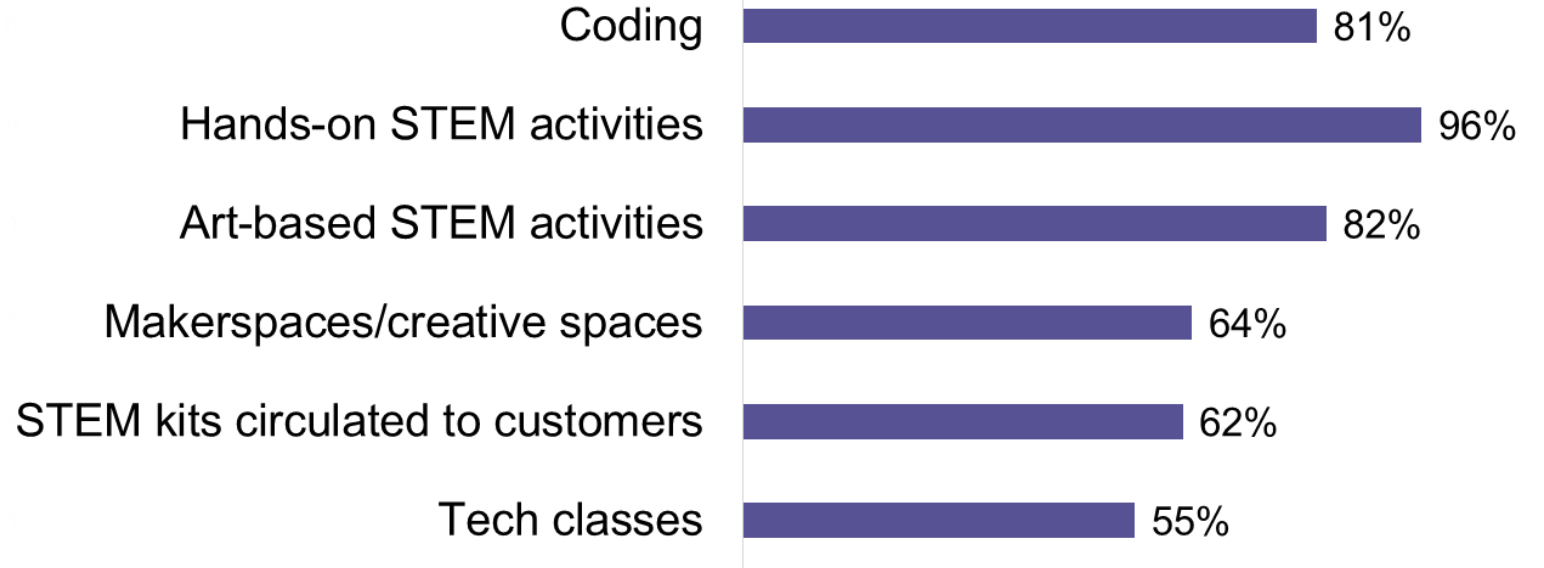
Coding		81%
Hands-on STEM activities		96%
Art-based STEM activities		82%
Makerspaces/creative spaces		64%
STEM kits circulated to customers		62%
Tech classes		55%

Percentages are out of 74 responses

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Detailed Notes: Current/Future STEM Learning

Coding is the top STEM-rich learning experience offered in libraries across the UK and Ireland.

Interviews emphasized the strong interest among public libraries in providing other fun STEM or STEAM events and services, now and in the future.

STEAM

Detailed Notes: 'STEAM'

'Digital literacy' or 'digital inclusion' are more commonly used terms than 'STEM'.

This research suggests that the broader range of topics and implications of additional STEM topic areas would benefit library customers. Explicitly including the arts highlights the creativity that is central to STEM learning for library customers, while also helping library staff to build on their existing expertise in facilitating arts-related learning.

'STEAM' maps well to strategic plans published by multiple leading organisations within the library sector. STEAM adds rich dimension to topics such as health and well-being, cultural engagement, economic prosperity and literacy.

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STEM Learning in Libraries Is About…

Promoting lifelong learning

Critical literacy and digital literacy

Inspiring young people on careers of the future…

– Interviewee

STEM: An Evolving Offer

- 93% are interested or extremely interested in offering STEM learning opportunities to their customers

- 7% are somewhat or a little interested

Percentages are out of 75 responses

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STEM Provides New Opportunities for Library Customers

I think 99% of our [STEM] activities are very successful because they are things that people haven't had access to in the past.

– Survey respondent

Funding for STEM Offer

Most respondents (86%) rely on the library budget to fund STEM-related events and services.

Percentages are out of 73 responses
Respondents could select multiple options

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Obstacles to Overcome

The top factors that prevent respondents from beginning or increasing STEM-related events and services include:

1. Lack of funds and lack of staff time

2. Library staff not knowledgeable about STEM topics

3. Lack of equipment/supplies

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A Way Forward: Cross-sector Collaboration

Research participants described the many benefits of offering STEM learning for library customers — and also highlighted the many factors that hinder this important work.

This research was designed to identify approaches that could help library staff and their collaborators mitigate challenges.

Collaboration Focus: Training

Practical, face-to-face, hands-on training is a top need for library staff to facilitate STEM learning in their communities.

Collaborators — both from other libraries and other sectors — have much to offer in addressing this need.

Collaboration Focus: Communication

Library staff need access to information and ideas to support STEM learning for their communities.

Communication across both the library sector and with STEM-related sectors could address key needs around accessing local STEM expertise and resources, as well as identifying funding opportunities.

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Idea: Include Other Sectors in Library Networks

Inviting existing or potential collaborators from other sectors into existing listservs, online forums, in-person meetings and other communication channels for library staff may lead to new innovations and ultimately bring STEM learning opportunities to more communities.

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Collaboration Focus: STEM Activities

Library staff need how-to procedures for facilitating hands-on STEM learning, but it is critical that those STEM experiences be:

- *FUN*
- Tailored for audiences of varying ages and skill levels
- Built upon events and services that the library already offers (e.g. creative workshops)

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Serendipity and STEM

The great thing about libraries is that they help people realise that they are interested in something that they didn't know they were interested in.

[STEM learning in libraries] is the opportunity to do a bit of coding or try something different, the serendipity of finding something, like an exhibit…[and] finding something about their potential.

– Interviewee

Current STEM Offer

What STEM-rich learning experiences are currently in place in libraries?

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Bureau of Educational and Cultural Affairs

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STEM Learning in Public Libraries

Of those library staff who chose to participate in this research:

- 92% offer STEM events at least occasionally
- 52% offer them frequently
- 4% are not sure
- One respondent offered the perspective of someone who has never tried offering STEM events

Percentages are out of 77 responses

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Current Ages Targeted

Infants

2% — Infants
18% — Toddlers
38% — Ages 3-5
71% — 6-8
87% — 9-12
50% — 13-17
29% — 18-24
30% — 25-40
32% — 41-64
43% — 65+
40% — Intergenerational

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Bureau of Educational and Cultural Affairs

Percentages are out of 84 responses
Respondents could select multiple options

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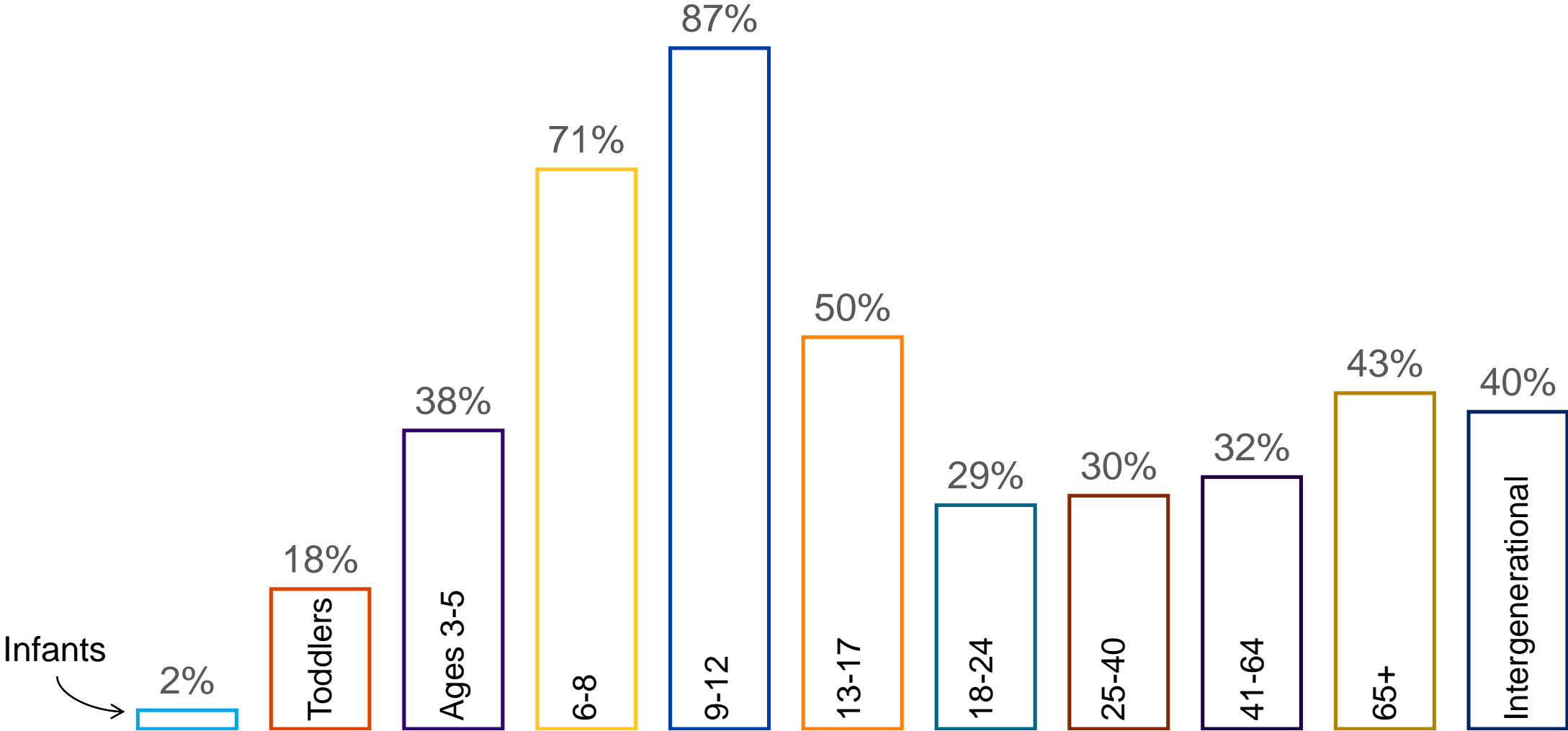
STEM for Young Library Customers

Currently, libraries primarily target 6-12-year-olds with STEM events.

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STEM for Both Girls and Boys

STEM learning is important to both boys and girls and that traditional 'male dominated' professions are not out-of-reach for girls learning STEM

– Survey respondent

…and Their Parents

There are a lot of challenges around getting girls (teenage specifically) to take part in STEM subjects, including parent's perception.

– Survey respondent

Current STEM-rich Learning Experiences

Coding is the top format offered by respondents.

Hands-on STEM activities are also offered by 75% of respondents.

Over half offer art-based STEM activities (54%).

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STEM and Digital Literacy Priorities

...it's important we do run these activities to grow the digital skills of our community.

– Survey respondent

Other STEM-rich Learning Experiences

Makerspaces/creative spaces (46%)

STEM kits circulated to customers (42%)

Tech classes (30%)

Robotics (29%)

Demonstrations (29%)

STEM-related storytimes (26%)

Interactive exhibits (18%)

Design-based learning (18%)

STEM-event-in-a-box (17%)

Lectures (17%)

STEM-related reading events (16%)

History-based STEM activities (13%)

Career-focused STEM activities (13%)

Discussions (12%)

Excursions to the library (7%)

Sky gazing nights (7%)

Citizen science projects (4%)

Documentary showings (4%)

Science Cafés (3%)

Percentages are out of 76 responses

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Idea: Share Examples of STEM Success

Library staff are exploring different ways to incorporate STEM learning into their events and services.

Others would benefit from hearing examples of how libraries are integrating STEM learning alongside their other priorities.

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Approach and Implementation

How do libraries approach and implement these events and services?

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Funding Sources

The library budget is the top-listed type of funding for STEM-related events and services:
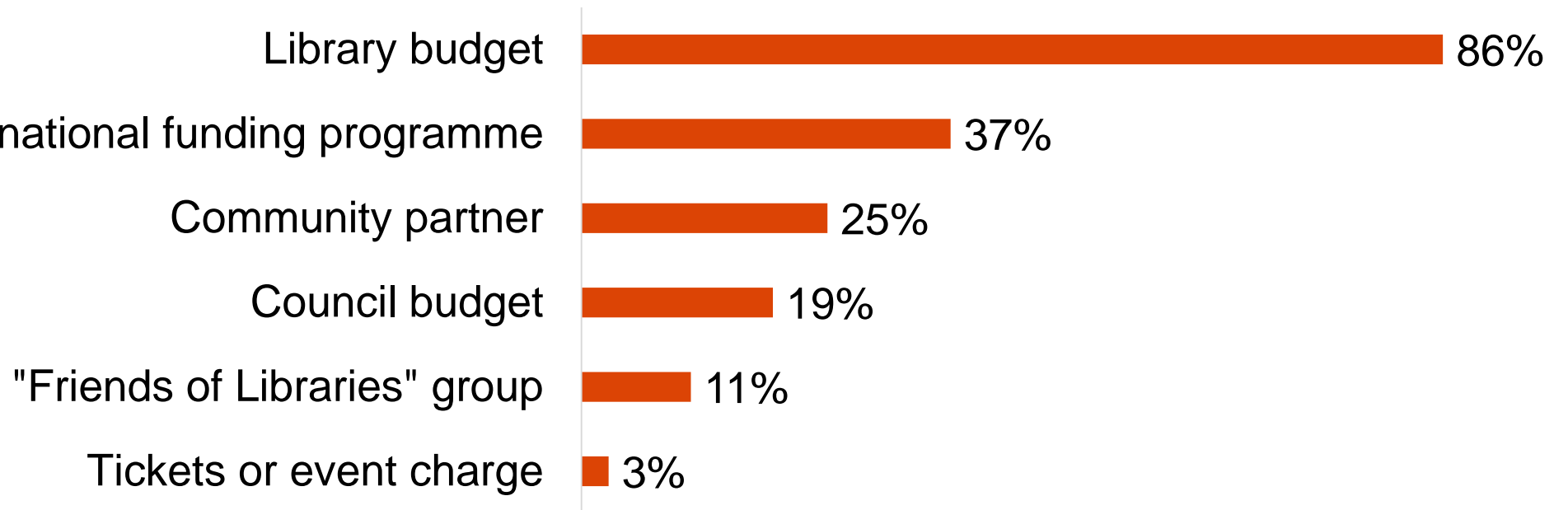
Library budget — 86%
Regional or national funding programme — 37%
Community partner — 25%
Council budget — 19%
"Friends of Libraries" group — 11%
Tickets or event charge — 3%

Percentages are out of 73 responses
Respondents could select multiple options

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Changing What's Expected of Libraries

For libraries generally, there's no expectation, no standards set around the fact that libraries could be/should be offering STEM…

Libraries are able to deliver STEM activities and…that would help [management] meet their agenda.

– Interviewee

STEM offer is mainly library-led

STEM-related events are developed (80%) and facilitated (79%) by-and-large by library staff.

For 8% of respondents, external service providers primarily facilitate STEM-related events.

For an additional 8% of respondents, volunteers are the primary facilitators.

Percentages are out of 75 responses

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Externally Developed STEM Events

External service providers are the primary developers of STEM-related events for 12% of respondents. Volunteers are the primary developers for only 3%.

Percentages are out of 75 responses

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Detailed Notes: STEM offer is mainly library-led

5% of respondents had situations that did not fall into the given categories and selected 'Other' for this question.

For example, the staff involved in developing and facilitating STEM events at libraries were situated at the council, rather than the library, or multiple categories applied.

Percentages are out of 75 responses

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Complementary Goals

Working in partnership…enables you to work with people who have expertise in STEM. That's what their expertise is, and we have the venues and the demographic who are not engaged in STEM.

– Interviewee

STEM Learning Collaborations

Respondents selected a wide variety of organisations with which their libraries partner or collaborate for STEM expertise and/or STEM resources. (Only one respondent selected 'none'.)

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Collaboration fueled by coding opportunities

About half (51%) of respondents partner/collaborate with coding education franchises or charities.

Percentages are out of 82 responses
Respondents could select multiple options

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Promising Collaborations: Other Libraries and Volunteer 'Ambassadors' of STEM Subjects

Less than a third of respondents work with other libraries (30%) or volunteer "ambassadors" of STEM subjects (29%).

Some interviewees described how essential these collaborations are to their current STEM offer.

More libraries could benefit from cultivating these relationships in the future.

Percentages are out of 82 responses
Respondents could select multiple options

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Support Needed for Sustainable Partnerships

…[S]taffing wise we don't necessarily have the expertise to offer STEM learning in-house so to speak as [it] depends on which staff have studied or have interest in STEM. I think partnering with organisations or volunteers who can offer STEM activities is key, however I think funding can be a tricky issue from both sides. A lot can be done from goodwill from both sides but I think paying people for provision and expertise is important from a sustainability point of view.

– Survey respondent

Cross-sector Collaborations

Roughly a quarter of respondents indicated collaborations with the following organisations:

- Community groups/clubs for underserved individuals (27%)
- Festivals (27%)
- Museums (26%)
- Further Education institutes/colleges (24%)
- Primary schools (23%)

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Detailed Notes: Collaboration

While few libraries currently partner with the following organisations, they may share goals around STEM learning with libraries and could offer valuable expertise or resources.

Less than a quarter of respondents listed art galleries/museums, not-for-profit organisations, makerspaces, or secondary schools as collaborators. Less than a fifth of respondents reported collaborations with government departments, agencies and public bodies, science/discovery centres or universities.

Fractions are out of 82 responses
Respondents could select multiple options

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New Connections: Universities

16% of respondents work with universities on STEM learning. Those library staff who collaborate with universities could offer insights to help other libraries develop relationships. Public engagement staff at universities are an excellent resource for initiating a conversation.

Further information can be found in Higher Education and Public Libraries: Partnerships Research, A report for Arts Council England.

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New Connections: STEM Employers

STEM employers such as industries and non-university research institutes were not selected to the extent than more education-focused organizations were.

STEM professionals at these organisations may be willing to advise on the library's STEM offer or help facilitate hands-on activities with customers.

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The potential for STEM learning in libraries, as observed by one library's STEM collaborator

I think public libraries are an absolute perfect location for short courses...practical activity…[and] potentially take-up of STEM by young people.

– Interviewee

New Connections: Informal Learning

While few to no collaborations were reported with the following organisations, their expertise could complement STEM learning in libraries:

- Observatories
- Zoos
- Historic environment organisations
- Aquariums
- Botanic gardens

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Equipment to Support STEM Learning

Respondents were able to offer a wide range of suggestions on equipment they've found to be most effective in supporting STEM learning in their libraries.

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Equipment Recommendations

The most common recommendations are:

- micro:bit
- LEGO
- 3D printer
- Makey Makey
- Tablet, such as an iPad
- Raspberry Pi

Idea: Actively Share Equipment Suggestions

Library staff who are experienced with such equipment have a lot to offer their peers. Those who are new to STEM would benefit from hands-on tutorials on how to use the equipment.

Even more important, how can that equipment be used to support customer creativity, active learning and other skills? Not only can staff from other libraries help in this area, but so can informal educators at museums and science/discovery centres.

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Possible Future Directions for STEM Learning in Libraries in the UK and Ireland

Research participants identified key areas for future focus in terms of topics, ages to target, and skills that learners can develop.
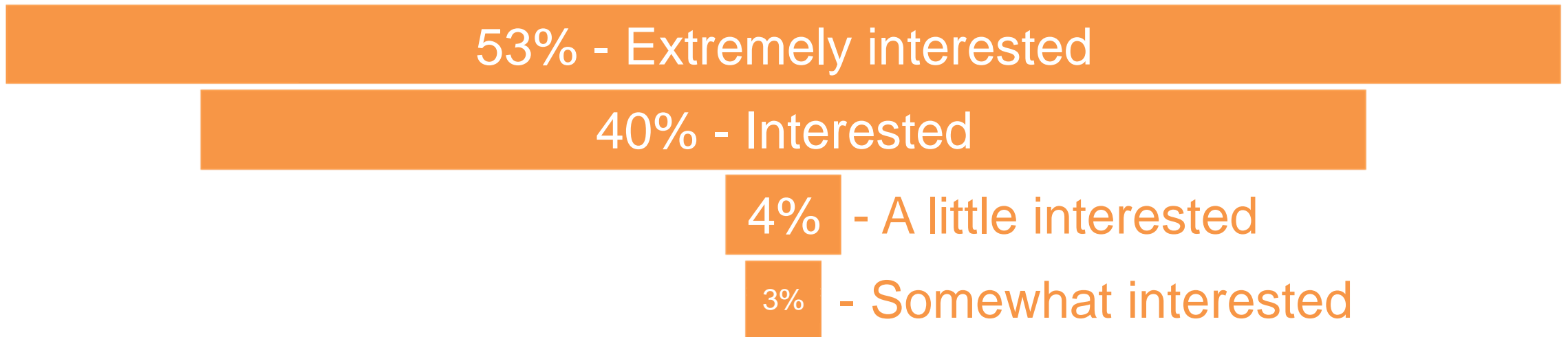
Future STEM Interest

All respondents have an interest in offering STEM learning opportunities to library customers.

53% - Extremely interested

40% - Interested

4% - A little interested

3% - Somewhat interested

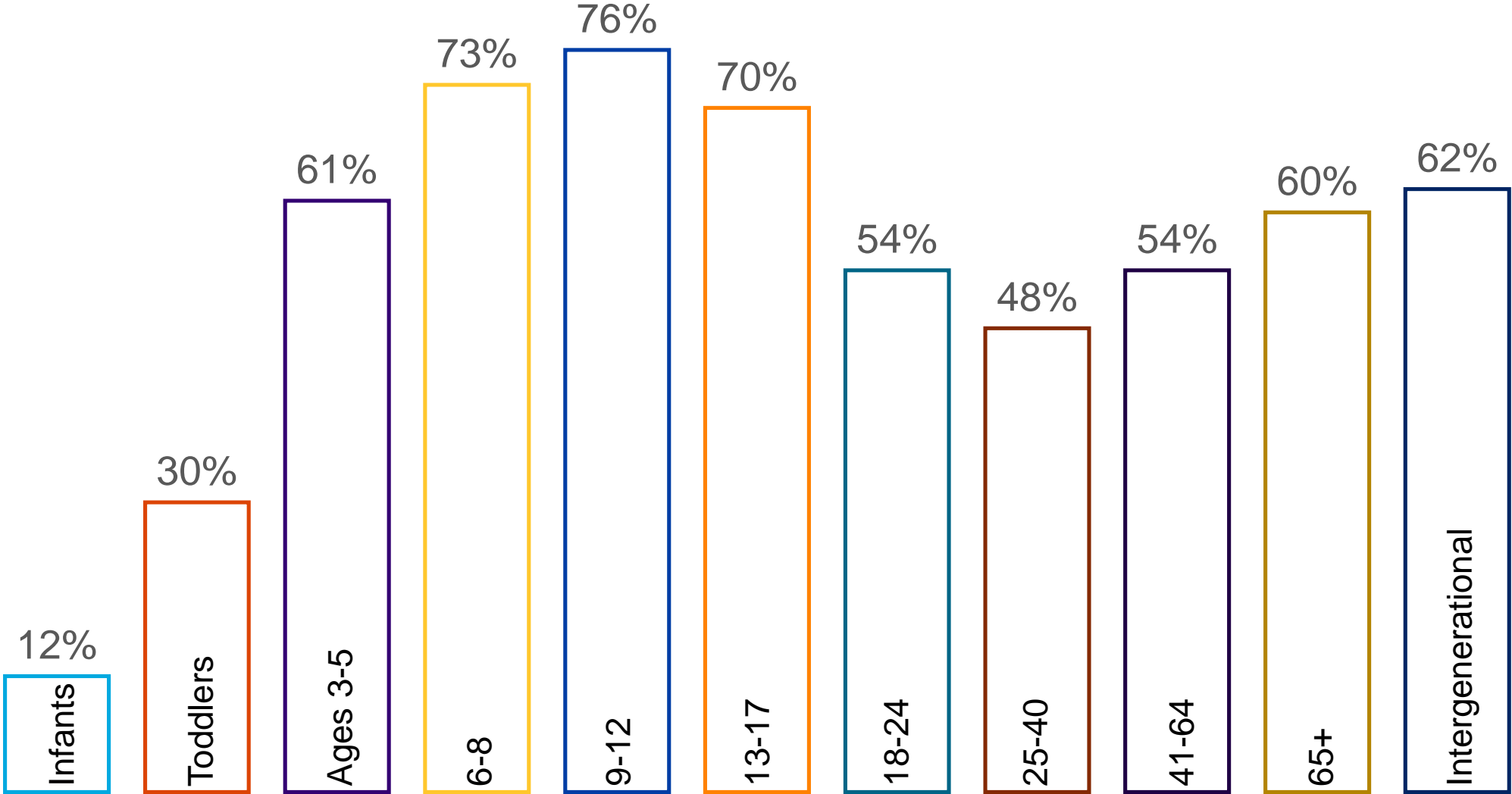Percentages are out of 75 responses

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Future Ages Targeted

The top three audiences that respondents would like to reach with STEM events are consistent with those groups that are currently targeted:

1. Ages 9-12 (76%)
2. Ages 6-8 (73%)
3. Ages 13-17 (70%)

Percentages are out of 84 responses
Respondents could select multiple options

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Future STEM Format: Hands-on STEM

The majority of respondents (96%) selected hands-on STEM activities as a learning format they felt would be successful with their customers.

Percentages are out of 74 responses
Respondents could select multiple options

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Detailed Notes: Other Future STEM Formats

Respondents indicated interest in the following types of STEM learning, and there are libraries that currently offer such events and services. Their expertise could help other libraries expand into these areas.

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Other Future STEM Formats

Popular future STEM learning formats where many libraries currently have experience:

- Art-based STEM activities (82%)
- Coding (81%)
- Makerspaces/creative spaces (64%)
- STEM kits circulated to customers (62%)

Percentages are out of 74 responses
Respondents could select multiple options

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Some Future Interest

Some libraries also offer expertise in these relatively popular areas for future STEM events and services:

- Makerspaces/creative spaces (64%)
- STEM kits circulated to customers (62%)
- Tech classes (55%)
- Robotics (53%)

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Detailed Notes: Possible Additional STEM Formats

While this research indicates that the following STEM learning formats are not currently common in libraries across the UK and Ireland, but there is a notable increase in the percentage of respondents who feel they would be successful with their customers.

Possible Additional STEM Formats

Compared with current STEM offers, these areas are notably popular as future STEM events and services:

- Interactive exhibits (58%)
- STEM-related reading events (43%)
- History-based STEM activities (39%)

Detailed Notes: Cutting-edge Formats

While there appears to be fewer examples of the following STEM learning formats on offer across the UK and Ireland currently, there was a notable increase in popularity for these types of events and services. Informal organisations, such as science/discovery centres may be a good source of advice and examples for libraries to adapt.

Cutting-edge Formats

Additional formats selected for engaging library customers in future STEM-rich experiences:

- STEM-event-in-a-box (42%)
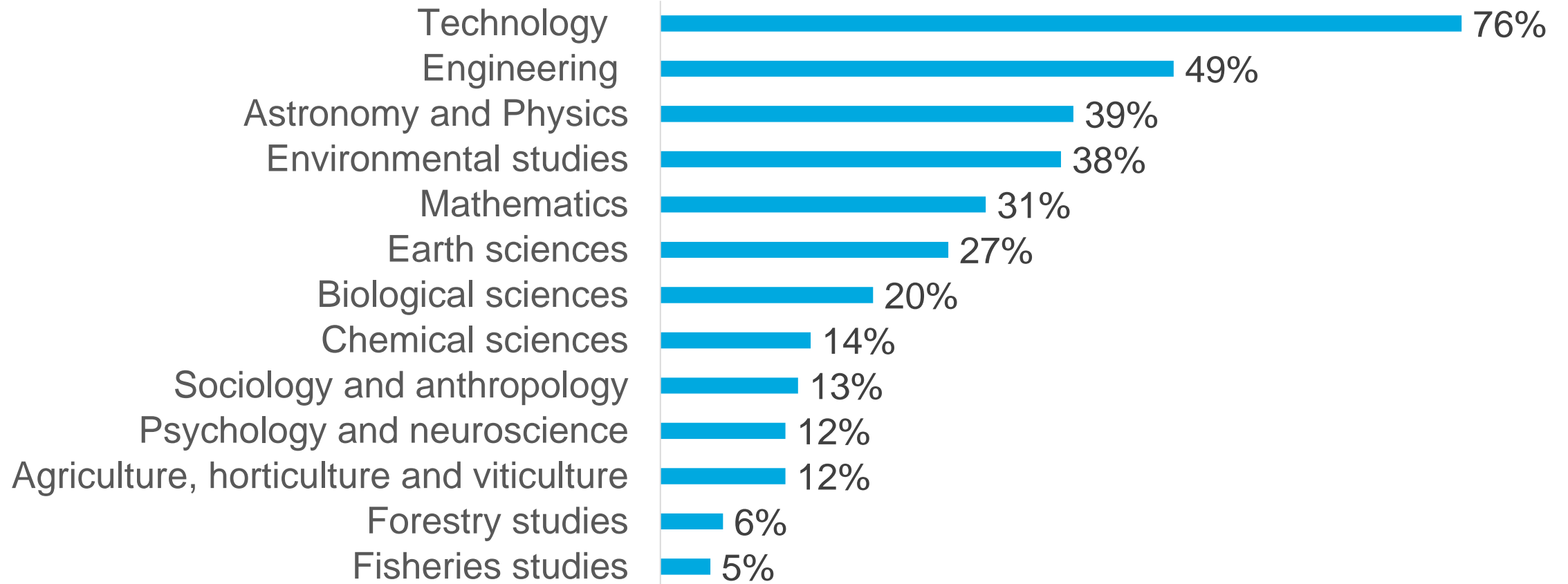- Science Cafés (26%)
- Citizen science projects (23%)

Percentages are out of 74 responses
Respondents could select multiple options

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STEM Areas of Interest

Area	Percentage
Technology	76%
Engineering	49%
Astronomy and Physics	39%
Environmental studies	38%
Mathematics	31%
Earth sciences	27%
Biological sciences	20%
Chemical sciences	14%
Sociology and anthropology	13%
Psychology and neuroscience	12%
Agriculture, horticulture and viticulture	12%
Forestry studies	6%
Fisheries studies	5%

Percentages are out of 84 responses
Respondents could select multiple options

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Detailed Notes: STEM Areas of Interest

12% of respondents also selected 'Other' to capture additional interests that do not fit into these categories. They include interests in highlighting the library's collections, as well as the integration of the arts.

Percentages are out of 84 responses
Respondents could select multiple options

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Culture as Reading, Arts, and Science

[A] key thing in library service is we want people to be able to come in and experience culture. Reading is part of culture. Science is a cultural thing as much as the arts.
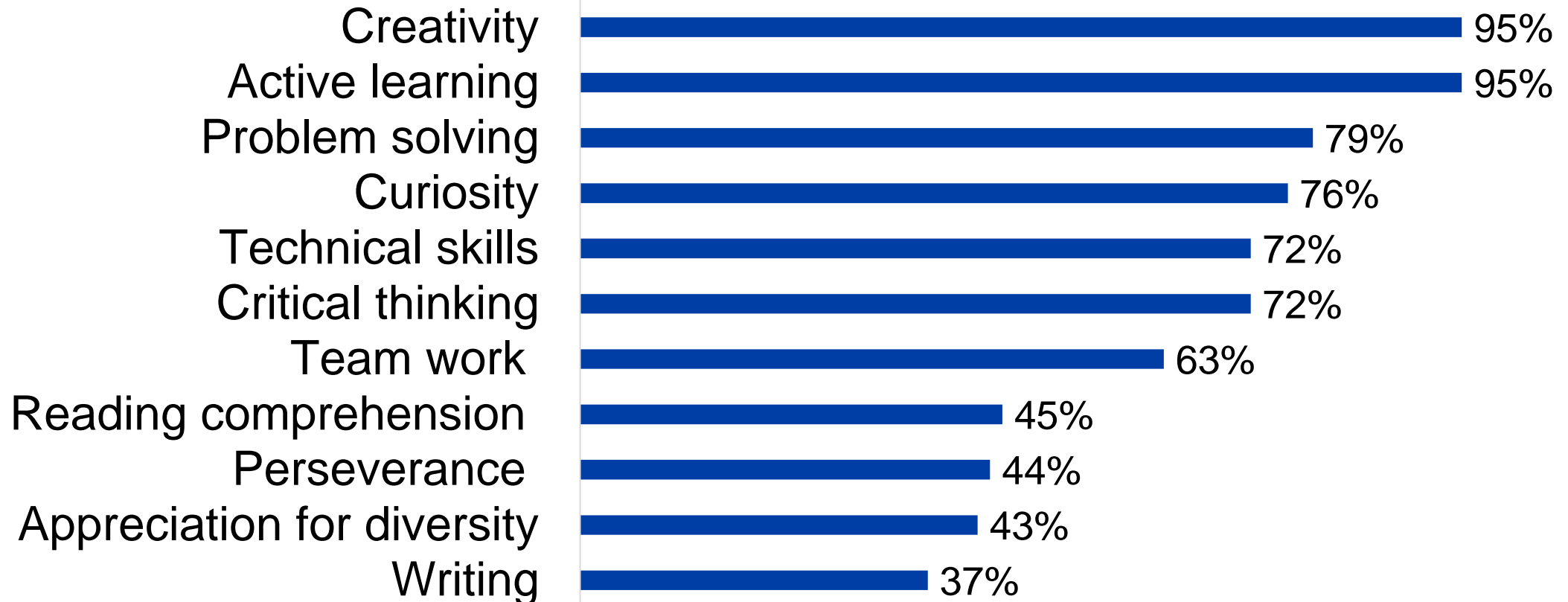
– Interviewee

Top Skills for Customers to Develop

The majority of respondents (95%) listed the following as the types of skills that they would like customers to put into practice during STEM events at the library:

- Active learning
- Creativity

Percentages are out of 75 responses
Respondents could select multiple options

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Integrating the Arts

…[T]here needs to be an art, craft aspect [to be successful with our customers]; that's the best gateway to move into STEM activities. Libraries have always done crafts, so now we're introducing STEM into crafts.

– Interviewee

Obstacles

What obstacles prevent libraries from incorporating more STEM events?

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Top Obstacles: Limited Staff Time and Funds

Lack of staff time and funds are the factors that prevent 83% of respondents from beginning or increasing STEM-related events and services at their libraries.

Percentages are out of 72 responses
Respondents could select multiple options

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Staff Knowledge and Equipment

Other factors for over half of respondents include:

1. Library staff not knowledgeable about STEM topics
2. Lack of equipment/supplies

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Other Obstacles of Concern

For some respondents, other factors are preventing them from beginning or increasing STEM-related events and services at their libraries:

- Lack of local STEM expertise and/or resources
- Lack of adequate space
- Library staff not prepared to develop and lead STEM-rich learning experiences
- Unsure where to start in developing STEM events

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Needed: A New Perception of Libraries & STEM

Libraries are not just books — if indeed they ever were…[We need] strong advocates who see the library as a place where STEM-rich learning takes place.

– Interviewee

Respondents Face Barriers

No respondents report that they have no barriers to beginning or increasing STEM-related events and services at their libraries.

Tensions in Priorities

We hope to have more STEM based events in the next year…However the focus of the management is very much on art and creative activities…

– Survey respondent

STEM-related Training and Resource Needs

What kind of training and resources would be most helpful to librarians?

These findings are intended to help collaborators and partners identify ways to support library staff in facilitating STEM learning for diverse communities.

Communication Channels

Respondents' top sources for learning about STEM activities, opportunities, and resources were:

- Online library networks
- Online research
- Email
- A variety of non-library resources such as Code Club and STEM Learning

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Idea: Central STEM Communication Hub

Library staff would benefit from a single source of information about STEM activities, opportunities, and resources. Through both the survey and interviews, respondents indicate that it is a challenging communications landscape to navigate.

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Idea: Foster Communication Across Sectors

Proactively including other sectors, such as universities, industries, and museums, in a centralized communication hub could address multiple obstacles to STEM learning in libraries.

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STEAM Training Opportunities Needed

[T]here is a distinct lack of learning opportunities for library staff re STEAM subjects.

– Survey respondent

Top Professional Learning Support

Face-to-face formal training is ranked as the most valuable form of professional training/continuing education.

Ranking by 66 respondents

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Practical Strategies Needed

*This [offering tech sessions] is bordering on teaching…In a library, have a range of people —
we need to manage the dynamics of some who are really lagging, others very advanced.*

– Interviewee

Connections with Others

The next most valuable forms of professional training/continuing education involve significant connections with others on the topic of STEM learning in libraries:

- Community of Practice
- Face-to-face informal events

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Detailed Notes: Connections with Others

A community of practice is a group of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly. This may be conducted online, face-to-face or a combination of the two.

Online Courses Ranked Higher Than Conferences

Online courses or webinars were ranked more highly than a national conference that brings together library and STEM professionals or presentations at conferences.

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Idea: Organise a Unified STEM Offer

One interviewee used the term 'isolation' to describe his/her top obstacle relating to STEM. The individual described how having micro:bits all at the same time led to 'unity and voice across the whole country'.

To address this challenge, a toolkit or set of advice from library staff who've been facilitating STEM learning for 3-4 years, combined with a core kit that the library could purchase, would be very beneficial.

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Most Helpful STEM Resources

Top-ranked resources and opportunities for increasing the amount and quality of STEM learning opportunities in libraries include:

1. Contacts to access local STEM expertise and/or resources (e.g. guest speakers)

2. How-to procedures for facilitating hands-on STEM activities, games, crafts, and demonstrations

3. Announcements of funding opportunities you can apply for

Ranking by 69 respondents

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Activities Needed for Unique Library Environment

There are lots of teacher activities online, but not much for libraries.

– Interviewee

Lower Priority STEM Resources

The following resources and opportunities are not currently ranked highly:

- Online and open educational resources (e.g. online interactives, mobile apps)
- Sample event ideas
- Sources for ready-made event materials and kits
- Opportunities to host STEM exhibitions
- Self-guided STEM activities for library customers to do on their own
- Framework to evaluate and report event outcomes
- Promotional resources (e.g. images, flyer templates)

Ranking by 69 respondents

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Wider Understanding of the Role of Libraries

It would be helpful to have…

Advocacy materials re the role of libraries in [the] STEM agenda & the economic benefit

and

national recognition of the role / contribution of public libraries

– Survey respondents

About the Research Participants and Their Libraries

This research includes perspectives from multiple community types, but future research should endeavour to have more input from front-line staff.
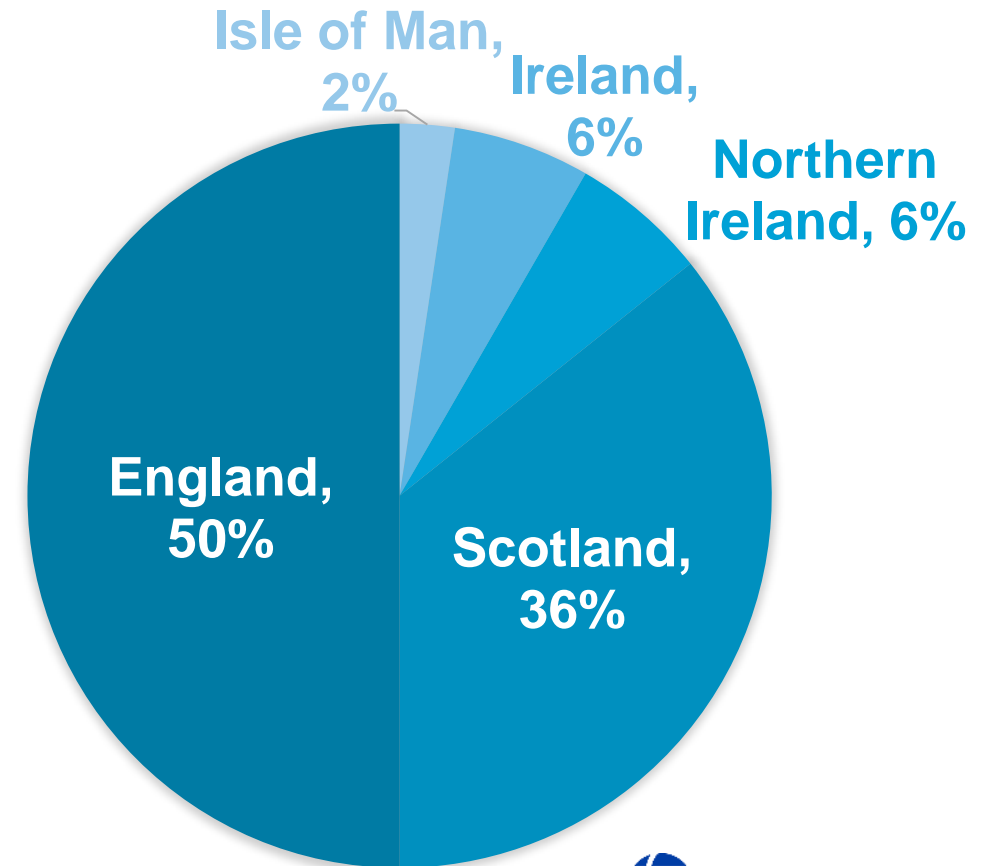
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Additional Perspectives Needed

The overall response rate for this research was lower than anticipated (based on participation rates in the U.S. and Australia for similar surveys).

No public library staff from Wales participated.

Participation By Jurisdiction

Isle of Man, 2%
Ireland, 6%
Northern Ireland, 6%
England, 50%
Scotland, 36%

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Detailed Notes: Participation

Library professionals from various community types across England, Scotland, Northern Ireland, the Isle of Man, and Ireland provided their anonymous responses from August - December 2019. This slide set presents recommendations from input provided by 89 survey respondents and 16 interviewees from public libraries.

Community Types

The majority of respondents represented metropolitan/urban and outer metropolitan/suburban communities.

14% identified their communities as primarily rural and countryside. An additional 20% represented multiple libraries situated in various community types; the majority these respondents included both urban and rural types.

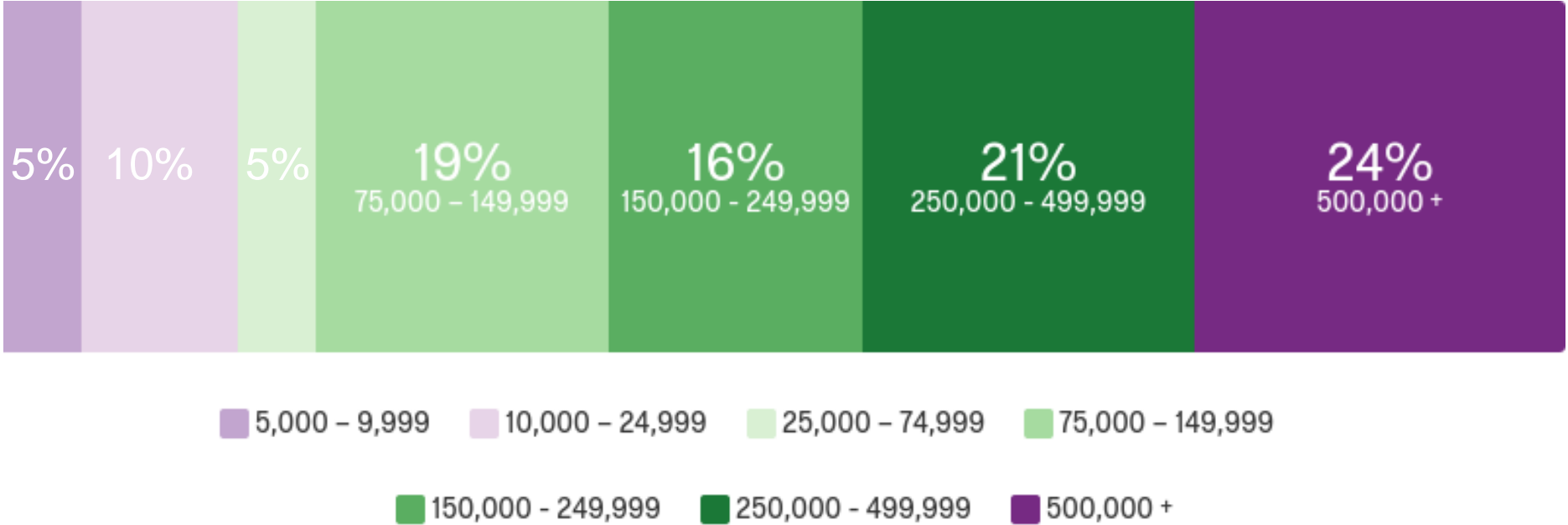Only two respondents represented "remote" communities.

Percentages are out of 85 responses

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Library Service Areas: Population Sizes

| 5% | 10% | 5% | 19%
75,000 – 149,999 | 16%
150,000 - 249,999 | 21%
250,000 - 499,999 | 24%
500,000 + |

Legend:
- 5,000 – 9,999
- 10,000 – 24,999
- 25,000 – 74,999
- 75,000 – 149,999
- 150,000 - 249,999
- 250,000 - 499,999
- 500,000 +

Percentages are out of 80 responses

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Rural Libraries and STEM

Public libraries can offer a more community approach to STEM education and be the centre for…STEM development in a rural area where access to STEM isn't available

- Survey respondent

Respondents' Positions

Respondents identified a variety of positions held within a library or council.

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Detailed Notes: Respondents' Positions

Despite every effort to invite participation across all staff levels, over half of respondents were in leadership or managerial positions. As a result, this research may not adequately capture the perspectives of front-line staff and further research is needed.

Respondents' position titles indicated specializations in development or fundraising or services related to digital, STEM or science offers. There were also specializations in learning or a focus on serving families, parents, children and youth.

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Initial Insights from Other Library Types

Academic and Special Libraries & STEM

Individuals from academic and special libraries in Wales, England, Scotland, and Ireland provided their perspectives on STEM learning in libraries.

Their input is provided here to suggest areas for future research. These findings not as representative of the whole. However, their participation in this research demonstrates the potential of including their perspectives in future work.

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Current STEM interest

Future research with academic and special library staff can gauge STEM interest.

In the small sample size collected here, 3 of 6 respondents offer STEM events occasionally (3 to 4 times a year).

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Current Ages Targeted

These STEM events are targeted toward a variety of age levels, including children as young as 6-8 years and adults ages 65+.

Selections by a total of 4 respondents

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STEM is a way to bring in customers

We're always looking for ways to have people come in to look at our rare books and archives….Outreach…is so important.

– Interviewee

Current STEM Offer

Respondents selected many formats to describe the STEM-rich learning experiences that they offer, including:

Career-focused STEM activities

Demonstrations

Excursions to your library

Hands-on STEM activities

History-based STEM activities

Lectures

Sky gazing nights

Makerspaces/creative spaces

Robotics

STEM kits circulated to customers

Selections by a total of 4 respondents

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School Libraries & STEM

Individuals from school libraries in Ireland, England, and Scotland provided their perspectives on STEM learning in libraries.

Their input is provided here to suggest areas for future research. These findings not as representative of the whole. However, their participation in this research demonstrates the potential of including their perspectives in future work.

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Current STEM interest

Future research with school librarians and library service staff can gauge STEM interest.

In the small sample size collected here, 3 of 5 respondents offer STEM events occasionally (3 to 4 times a year).

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Current STEM offer

The majority of respondents (4 out of 5) selected coding and hands-on STEM activities as the STEM-rich learning experiences offered by their libraries.

Selections by a total of 5 respondents

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Current STEM offer

For the majority of respondents (4 out of 5), STEM-related events are developed by external service providers, but facilitated by library staff.

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The Space Science Institute's National Center for Interactive Learning provides free hands-on activities, resources, and training to library professionals through its *Science-Technology Activities and Resources Library Network* (*STAR Net*). Core partners include the American Library Association (ALA), Urban Libraries Council, Cornerstones of Science, American Society of Civil Engineers, and many other organizations. Major funding is provided by the National Science Foundation, NASA Science Mission Directorate, and the Institute of Museum and Library Services.

STEM ACTIVITY Clearinghouse

Credit: T..L. Temple Memorial Library

**Searchable
Hands-on
Free
Curated
Trusted**

http://clearinghouse.starnetlibraries.org

STEM Tips and Resources

Sharing Bright Ideas for Family Engagement in STEM through the Living Ideabook

Guest post by Margaret Caspe, PhD – Director of research and professional learning at Global Family Research Project How can LED lights, conductive copper tape, and coin batteries bring brightness to families in Homer, Alaska during the darkest

By admin | July 10th, 2018 | Categories: Uncategorized | 0 Comments   Read More ›

Tips from Tassie

Credit: NASA   South of Australia lies its island state, Tasmania. (Australians shorten the name to Tassie, which rhymes with "snazzy.") Roughly half of this island is protected; its wilderness is listed --

By Keliann LaConte | July 14th, 2018 | Categories: Elementary Aged, Technology, Uncategorized | 0 Comments   Read More ›

Take a Hike! (At the Library?)

...ier this year, in the spring, Kenton County Public Library, Kenton County Parks and Recreation, the City of Erlanger, ...lick Watershed Council, the Kenton County Conservation District, and Sanitation District No. 1 all partnered

...nnifer Beach | July 9th, 2018 | Categories: Elementary Aged, environmental education, ...ral, Informal Learning, Middle School Aged, Pre-School, Uncategorized | Tags: activities, ...ry, Creative Learning, Informal Learning | 0 Comments   Read More ›

www.starnetlibraries.org/blog

STEM Kits

Libraries across the U.S. are utilizing facilitation kits to provide more structure to their event plans, and check-out kits to help their customers take the experience home. Explore tips and resources for expanding – or starting – your own kit programme.

Check-out Kits
Facilitation Kits
Customizing Kits
Cataloguing Materials
Educational Games
Fines and Fees

www.starnetlibraries.org/resources/stem-kits

Apps

www.scigames.org