

ROMANIAN SCIENCE FESTIVAL

EVALUATION REPORT

November 2025



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INTRODUCTION

The Romanian Science Festival (RSF) is a not-for-profit initiative whose stated aims are to encourage people to understand the world around them through science; to this end, RSF organises a series of predominantly science focused activities and events, including science festivals organised in cities, smaller towns, and villages, as well as through online activities.

This evaluation report focuses on the festival events put on by the initiative in cities and smaller towns and villages in Romania, to explore how they meet their aims.

The report draws on a contribution analysis approach that identifies key relevant stakeholder groups and outcomes, engages with the hypothesised mechanisms of change for each of them as relevant to the various aspects of the activities they are meant to be engaged in by the RSF, and outlines insights from data gathered from these stakeholder groups at several festivals that took place in the summer and autumn of 2024.

The report is structured as follows.

The Romanian Science Festival is first introduced, outlining the initiative's aims and programmes, and detailing the format and processes behind the festival programme.

The evaluation methodology is then described. This includes the attribution problem, that is the question which the collected data seeks to address in looking to attribute observed outcomes to the initiative's programmes.

The initiative's theory of change is then detailed, with a specific focus on the expected mechanisms of change and intermediate outputs that the initiative looks to translate into its ultimate outcomes.

Insights from data collected from various stakeholder groups are then presented, guided by the theory of change and ultimately engaging with the attribution problem.

The report then concludes in terms of the initiative's impact and suggestions for next steps.

ROMANIAN SCIENCE FESTIVAL

The Romanian Science Festival (RSF) is a not-for-profit initiative which aims to inspire people of all ages and all backgrounds to engage with and understand the world around them through scientific knowledge.

AIMS

Specifically, the initiative aims to:

- Promote non-formal and hands-on, practical science education, for students and the general public.
- Connect the Romanian scientific diaspora to the local Romanian educational space.
- Act as a platform to convene people and organisations with an interest in science.

In relation to its first aim, RSF looks to increase awareness of science, its real-life relevance and applications, in ways that go beyond the school curricula the general public would be familiar with.

An important aim of the initiative is to mobilise the scientific diaspora, that is Romanian citizens who work in science and STEM fields but live outside of the country. These individuals act as mentors to students enrolled in Romanian schools, often reconnecting with their own prior educational experiences or contexts.

Overall, RSF looks to increase awareness of science as a career for young people and improve general attitudes to science. One way to facilitate this is to act as a platform to convene both individuals and organisations which promote science.

ACTIVITIES

The initiative organises several types of events to achieve its aims.

The flagship programme consists of the main Romanian Science Festival, which also lends its name to the whole initiative. Festivals are three- to four-day events which are organised in at least one and usually more locations in each respective county where RSF has a presence. RSF deliberately chooses locations that include large urban settings, small urban settings and rural settings (villages). Each festival therefore normally includes: a science fair in a large urban setting; science events (presentations, science career preparation events in high schools and/or the open-to-the public RSF Talks, a series of science talks); and a 'travelling' version of the science fair in smaller urban settings and villages ('caravana RSF').

The initiative also facilitates exhibitions, targeted programmes, and online activities, including themed webinars and online workshops.

THE FESTIVALS

Festival activities commence months before the in-person public events, with mentorship activities, whereby mentors who are members of the Romanian scientific diaspora work with high school students enrolled in state high schools in Romania.

The mentorship focuses on a range of topics, including the science experiments to be demonstrated at the festivals, as well as general conversation about science and science careers. The mentors work in partnership with the mentee students, who include all students engaged, whether in the practical science demonstrations or who are involved in the practical organisation of the festival. Mentors also work with the participating students' teachers, to organise each festival.

Mentorship includes the organisation of the practical science demonstration. For each of the main science festival (in the large urban setting), teams including a mentor, a teacher and 2-3 students curate the scientific content of the science demonstration and experiments to be showcased during the festival.

Activity increases closer to the date of each respective public festival event, with the organising students liaising with public authorities and other relevant stakeholders to put on the event. They are supported in this by mentors with local ties and by their teachers.

Immediately ahead of the festival, students, teachers and the mentor who are able to be present in the country meet to finalise details, and to facilitate further collaboration.

On the day of the festival, mentee students demonstrate a series of science experiments and other science-related activities, with support from the mentors who are physically present. The festival is open to the public, so organising students have practical responsibilities that range from setting up equipment to guiding visitors through the festival exhibits.

The initiative looks to build communication skills around two dimensions. First, science communication is emphasised, with the science demonstrations and communication with members of the attendee public the mechanism by which this is enabled. Second, the improvement of students' general communication skills is also sought. Communication between students and mentors and their teachers takes place throughout the preparation period, enabling personal engagement and building of rapport. As such, students observe how mentors and their teachers work together, build their awareness of science and science careers and also improve their communication skills (including with the general public).

The mentoring and communication conclude after the end of the public festival.

Some students choose to return in subsequent years, including as mentors, either to move from having a logistics-only role to being mentees and engaging with the hands-on science or because they wish to continue being engaged.

THE TRAVELING FESTIVALS

The traveling festivals are an element of the RSF Science Festivals, organised with the same students and teachers as the main festival in each respective local area, and as much as possible bringing in local schools and the local community. These in-person events usually attract a smaller audience than the large urban setting festival but their structure mirrors that of the full-scale festival, of which they are part.

EVALUATION APPROACH

This report is based on a light-touch evaluation of RSF (and specifically the festivals element) using a contribution analysis approach.

EVALUATION AIMS

The aims of the evaluation were to understand:

1. The extent to which RSF has met its aims, and
2. How the different RSF stakeholders experience their engagement with RSF and perceive the impact of RSF.

THE ATTRIBUTION PROBLEM

The specific question the contribution analysis has set out to answer is:

Is it reasonable to conclude that RSF has contributed to the outcomes reported by each respective relevant stakeholder group?

The contribution analysis approach first outlines the attribution problem.

This has required the initial identification of:

- the specific aims RSF has set out for itself at a whole-programme level.
- all the stakeholder groups which are engaged in RSF activity, and which may contribute to its impact, in whatever way.
- the specific outcomes it is seeking to impact, for each identified stakeholder groups.
- the overall change RSF is looking to make and how this change may manifest in the stakeholder groups and the communities with which RSF is interacting.

CONTRIBUTION ANALYSIS APPROACH

The contribution analysis then proceeded with the development of a theory of change.

This required the articulation of

- a logic chain of inputs (actions, events, etc.), outputs (behaviours, etc.) and outcomes (mid- and long-term) which describe how the RSF impact may be realised
- the mechanisms by which change would occur, specifically the causal links between inputs, outputs and outcomes.

Alongside the framing of the attribution problem as above, the theory of change allowed for the collection of relevant data from relevant stakeholder groups in such a way as to enable the understanding of the causal mechanisms, even in the absence of a causal evaluation design that would automatically attribute change in the observed outcomes to RSF.

The two above steps relied on engagement from the project team, which entailed structured conversations around each of the above aspects and a review of existing documentation and evidence already gathered by the project team.

The development of the theory of change and the identification of relevant stakeholder groups enabled the contribution analysis to then proceed to collecting new data from all relevant stakeholder groups.

Data was collected through anonymous online surveys, targeted specifically at each stakeholder group. All participants were presented with full information sheets and provided their consent prior to engaging with the questionnaires.

The questionnaires deployed through these surveys were tailored to each respective stakeholder group and covered both mechanisms of change and perceptions of impact. Questionnaire items were sourced from relevant academic literature; only individual items were deployed, to minimise respondent burden and maximise response rates.

Emerging data was analysed, primarily descriptively, to engage with each respective element of the attribution problem above (the attribution propositions), in response to theory of change identified mechanisms, and as relevant for each relevant stakeholder group.

RSF'S THEORY OF CHANGE

This section provides a narrative account of RSF's theory of change as relevant specifically to the core festival activities of the overall RSF activity.

THE PROBLEM STATEMENT

Romania faces several challenges in terms of science education and promoting science as a desirable career path for young people. These include:

- Curricula that emphasise procedural scientific knowledge without deep understanding of scientific phenomena or the practical applicability of scientific concepts and ideas learned in school.
- Limited exposure to contemporary scientific research at an early age, despite STEM employers operating on the labour market.
- Limited exposure to relatable career models relating to science.
- Limited opportunities to develop young people's awareness of science, science careers, and scientists, including those working internationally.

RSF identifies several root causes for the above challenges:

- Despite high numbers of Romanians working in science and STEM fields internationally, a disconnect between these Romanian diaspora researchers and domestic education system prevents engagement.
- Limited exposure to contemporary scientific developments in traditional educational settings.
- Absence of relatable science and STEM role models for students, beyond their science teachers.
- Insufficient hands-on, engaging science education opportunities for students and the general public.

LONG-TERM IMPACT STATEMENT

RSF's long term vision is to create a scientifically literate Romanian society where young people and the general public are inspired to pursue careers in science and STEM fields more broadly, reducing the science education gap and strengthening Romania's innovation capacity.

RSF's ultimate long-term impact is to increase the participation of Romanian young people in science education and careers, via more positive attitudes to science both for young people and the general public facilitated through engagement with the scientific diaspora and through the bringing together of individuals and organisations with an interest in science.

AIMS

RSF's core aims are to:

- Promote non-formal and hands-on practical science education, for students and the general public.
- Connect the Romanian scientific diaspora to the local Romanian educational space.
- Act as a platform to convene people and organisations with an interest in science.

STAKEHOLDER GROUPS

The following stakeholder groups are engaged by RSF activities that seek to achieve its aims:

- **Students.** Enrolled in high schools in Romania, these students voluntarily engage with RSF's activities and the festivals specifically. They engage as mentees who go on to undertake the science demonstrations during the in-person festivals; and/or as logistics/organisier volunteers who support the practical planning and organisation of the festivals.
- **Teachers.** Based in schools attended by participating students, teachers (and occasionally educators and school administrating staff) support the students and facilitate the planning and organisation of the festivals.
- **Mentors.** Members of the scientific diaspora, they mentor the students, guide them through the science demonstrations, support the planning and organisation of the festivals. They may also be engaged in other initiative programmes, for instance organising and giving science talks, organising exhibitions, etc.
- **Local organising teams.** These are made up of the individuals from the above groups, and take active roles in planning and organising each festival and related activities.
- **General public.** They are invited to attend the festivals, which are planned to increase their overall engagement with science.

The above groups are either direct (the former three) or indirect (the latter) beneficiaries of the initiative. Two further stakeholder groups are relevant to RSF activities but are not active beneficiaries:

- **RSF core team.** They coordinate across the festivals and ensure consistency across the festivals. This includes: coordinating the local organising teaqms, applying for grants, seeking sponsorship, agreeing contracts, managing legal and financial aspects relating to each festival.
The RSF core team also coordinate national media campaigns and coordinate the mentorship activity, including recruiting and training mentors.
- **Local partners.** They are engaged by active beneficiaries or the core team to support the planning and organisation of each festival. This may include local authorities, science organisation, educational institutions, community organising groups, etc., depending on location.

INPUTS

The initiative, deployed as described above, relies on a series of inputs, falling within three main categories, as follows:

Human inputs	Financial inputs	Material (practical) inputs
Romanian high school students who are mentees and/or festival organisers	Funds: secured through direct donations or via company tax-efficient giving	Venues and spaces in multiple cities for main festival events; and in smaller towns and villages for the traveling festival
Local teachers, educators and school administrators	Corporate and institutional sponsorship	Practical materials that facilitate the festivals, including tents, furniture, and other pieces of equipment
The Romanian science diaspora: researchers and students working in science and STEM fields outside the country	In-kind contributions from partner organisations, including local authorities (e.g., free use of town spaces for festival events)	Educational materials and science demonstration equipment, including technical equipment, consumables, and public engagement materials
The RSF local organising team, made up of individuals above		Digital platforms and social media presence
The RSF core team: a group of volunteers leading RSF at a national level		Transportation and logistics support
Local community partners and sponsors who enable the festivals to take place		

ACTIVITIES

As above, the RSF includes a series of programmes, activities and interventions that together make up the initiative.

Core activities are represented by:

- The local science festivals, the RSF flagship programme, facilitated by initiative-participating students, mentors, local partners including teachers, and the core RSF team.
- The traveling festival, smaller-scale festivals taking place in smaller or more remote geographic locations.

Further, complementary, activities include:

- Art exhibitions which combine science and art under the ‘STEAM’ (Science Technology, Engineering, Art, and Mathematics) umbrella.
- Targeted programmes, such as science talks, usually organised in close connection to the festivals.
- Online activities including themed webinars and online workshops, on a variety of science-related topics.

OUTPUTS

The RSF festivals have a series of outputs, or direct results, as follows:

Quantitative outputs	Qualitative outputs
Number of participating students (any capacity)	High-quality science education content delivered during the mentorship activity
Number of mentors	High-quality interactive science learning opportunities delivered during in-person festivals (science experiments and demonstrations)
Number of schools and teachers engaged	
Number of festival attendees (general public)	Increased awareness of science and science careers by participating students

While the above quantitative outputs are routinely monitored and available elsewhere, the qualitative outputs are less readily measurable.

OUTCOMES

SHORT-TERM

The RSF intervention aims to translate the above outputs into a series of short-term outcomes. These short-term outcomes operate at the level of each beneficiary stakeholder group, as follows:

Students:

- Increased interest and curiosity in STEM subjects and science in general
- Improved understanding of contemporary scientific developments
- Enhanced awareness of science career opportunities, including internationally
- Development of scientific thinking and problem-solving skills

Teachers:

- Exposure to current scientific research
- Awareness of science career opportunities, including internationally
- Confidence in teaching STEM subjects
- Access to new educational resources and approaches
- Networking with scientific community

Mentors:

- Increased connection to the Romanian science education space
- Increased awareness of students' attitudes and views of science
- Personal and professional development, including around mentoring skills and science communication.

General public:

- Increased awareness of science and its relevance to daily life
- Greater appreciation for Romanian scientific talent
- Higher awareness of the connection to the scientific diaspora

These short-term outcomes are expected to be visible immediately after each respective festival and to be reinforced by the complementary activities.

MEDIUM/LONGER-TERM

In addition to the short-term outcomes, which are expected to be observable soon after each respective festival, RSF looks to achieve a series of medium and longer-term outcomes.

While the short-term outcomes relate to individuals, these medium/longer-term outcomes also include educational system-level and societal changes, as follows.

Students:

- Increased understanding of science study opportunities, including internationally
- Increased take-up of science subjects in higher education and in employment

Networks and partnerships:

- Established mentorship networks between mentors and students
- Development of sustainable partnerships between schools and other relevant science-focused organisations.

Educational system:

- Improved science education in schools, including through practical and hands-on approaches (mirroring the approach at festivals)
- Increase take-up of science subjects, in secondary school and in higher education

Societal:

- More positive attitudes to science for the general public
- Increased support for science education and research
- Strengthened scientific culture

Together, these outcomes look to general individual and systemic change that emphasizes the positive role of science in everyday life, and the role of science education within that.

KEY MECHANISMS OF CHANGE

RSF relies on a series of mechanisms of change to translate the set of inputs and activities into outputs and outcomes, respectively. These mechanisms operate at the level of the key stakeholder groups, as above.

Students:

Mentees engage with the mentors, thereby increasing their interest in science, and their awareness of different science fields and science careers. They engage with science in ways that they previously had limited opportunities to, particularly in relation to the latest international research in the science field of interest. This develops their communication skills, particularly but not limited to science topics, and increases their science self-efficacy.

Student organisers engage with the local organising teams to plan and organise the festival (and associated activities). They are given specific responsibilities, which see

them engage with other relevant stakeholders, local authorities and community groups as relevant, and their peers. Student organisers also engage with science in ways previously unavailable to them and understand the needs of the science experiments from a practical perspective. This increases their communication skills and their organisational skills, as well as their organisational self-efficacy. This also improves their teamwork and collaboration skills.

Teachers:

Teachers support the students and mentors with planning and organising the festival. They see this as professional development and take the opportunity to engage with mentors professionally. Teachers experience science and science education in ways different to their normal pedagogical practice, and dialogue is opened about this. This increases teachers' sense of being part of a professional learning community that values collaboration and sharing ideas to improve teaching practice. This in turn increases the difference they feel they are making to their students

Mentors:

Mentors engage with students, teachers, the local organising teams and other relevant groups. Through the mentoring activity, they share their science expertise and offer career insights to young people with otherwise limited opportunities to experience science in this manner. This improves their communication abilities and their organisational skills (particularly if they are present in-person for the festivals) and increases their self-efficacy in relation to supporting young people more broadly.

General public:

Individuals attend the festival (and complementary activities) and observe and engage with the hands-on science experiments and activities being demonstrated by the students and mentors. They may ask questions and are generally exposed to different approaches to engaging with science. This increases their awareness of science and of the variety of science fields and careers.

ASSUMPTIONS

RSF's realisation of its impact is contingent on a series of assumptions, pertaining both to all relevant stakeholder groups and the wider context in which the initiative operates.

These assumptions are:

- The RSF core team is able to manage the initiative through complex and evolving circumstances.
- The Romanian science diaspora (from which mentors are recruited) remain committed to supporting education in Romania and participating voluntarily in RSF activities.
- Target students and communities are receptive to science engagement initiatives.
- Educational institutions and their staff (primarily teachers, but also school administrators, etc.) are willing to engage with RSF and support its activities.
- Sustainable funding can be maintained to support the continued operation of the initiative.

- Local and national government and policy makers value and support science education initiatives.

RISKS AND EXTERNAL INFLUENCING FACTORS

The initiative also faces a series of risks, including:

- Funding for the initiative is secured through grants and similar mechanisms and is not permanent.
- Economic conditions severely limit educational investments.
- Political instability limits the possibility of international collaboration.
- Cultural attitudes towards science in the general public worsen.
- Practical, on-the-ground, support from local authorities and organisations reduces or is entirely absent.

A series of macro-scale external factors may also affect RSF.

- Changing international landscape limiting the ability of the scientific diaspora to engage in activities in Romania.
- The lack of availability of required financial inputs, from any of the established sources.
- Wider economic pressures which limit the deployment of public-facing activities.
- The de-prioritisation of science in school curricula.

Were these macro-scale external factors to manifest, they may negatively influence RFS's ability to mobilise the diaspora, may constrain its activities, and may limit the translation of activities into the desired impact.

ATTRIBUTION PROPOSITIONS

RSF's theory of change gives rise to a series of attribution propositions around how RSF may achieve its aims. These attribution propositions are empirically testable. In the absence of a causal evaluation design where impact from RSF on the above outcomes is isolated, empirical evidence addressing each proposition contributes to answering the attribution problem.

The propositions are:

Students:

1. All students report that the festival (and all associated activity, including the mentorship for mentees) has changed their view of science and how science can be learned, and offered them the opportunity to learn new things and to meet others with similar science interests.
2. Mentee students report that the festival, including the mentorship element, has improved their academic skills, communication abilities and science self-efficacy.
3. Organising students report that planning and organising the festival has improved their organisational skills, communication abilities, and organisational self-efficacy.
4. All student groups report high levels of science self-efficacy.

Teachers:

5. Teachers report that engaging with RSF is a key element of their professional development and has increased their ability to make a difference to the students they are working with.
6. Teachers report high levels of science teaching self-efficacy, which captures their perceived pedagogical ability in science, including their ability to expand their pedagogical repertoire.

Mentors:

7. Mentors report that mentoring has increased their organisational skills and communication abilities.
8. Mentors report high levels of science teaching self-efficacy.

General public:

9. The general public report that the festivals improved their awareness of how science may be learned, offered them opportunities to learn new things, and to meet others with similar science interests.
10. The general public also reports high levels of science self-efficacy.

Evidence supporting each of the above attribution propositions would provide a clear indication that RSF is working in ways consistent with its theory of change and achieving its aims.

DATA INSIGHTS

The questionnaires deployed in the online surveys were developed to address specific aspects of the theory of change and to offer answers to the attribution problem by directly addressing each of the testable propositions emerging around RSF.

Results from the analysis of survey data are therefore presented in order of the attribution propositions as presented above.

Where relevant, data is disaggregated by the festival which the relevant stakeholder group has engaged with. Where no meaningful between-festival differences are observed, this is noted and the data presented in aggregate. This is also the case where the number of respondents is limited, and disaggregation would limit the reliability of the insights.

SAMPLE

A total of 26 high school students engaged in science demonstrations responded to the survey (mentees), alongside 78 students engaged in the logistical elements (“organisers”).

Thirty-two teachers responded, as well as 11 mentors.

With the exception of two respondents from the above groups, all individuals engaging with the survey were engaged with either the Iasi or Maramures festivals.

A further 446 general public respondents engaged with the online survey. The majority of these respondents were students (79%), but the sample also included parents (11%) and teachers (4%). A small number of individuals (7%) not in any of these groups also responded. The general public responses referred predominantly to the Arges (41%) and Iasi (54%) festivals, with a smaller proportion from Maramures (4%) and only one respondent for Cluj.

Across all types of stakeholders, therefore, only Iasi, Arges and Maramures are represented, and no insights are available for Cluj. Because between-location differences are minor and response numbers would be small, results are reported in aggregate only. This also reflects the theory of change whereby there are no aspects that are meant to only operate in one festival location: while each festival and complementary set of activities may differ, the overall mechanisms of change are consistent across locations.

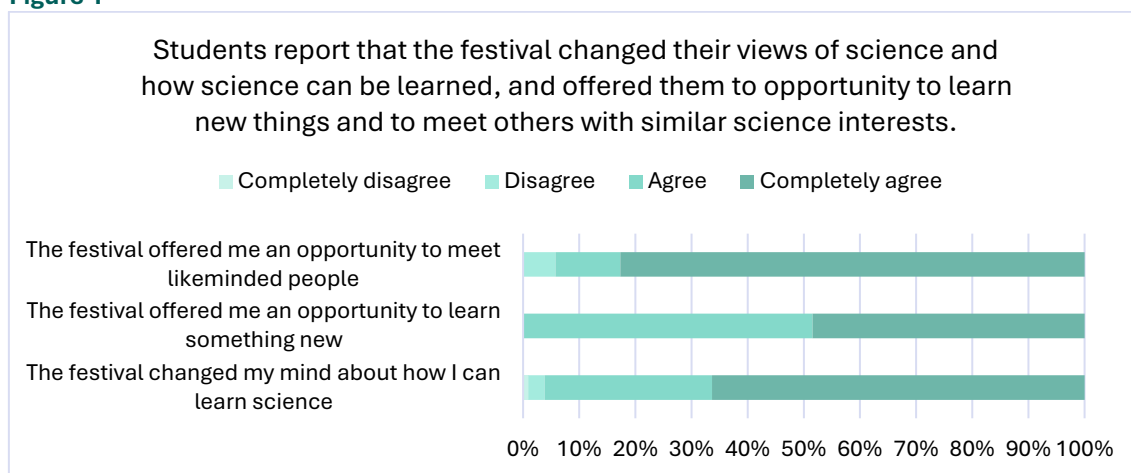
While a response rate cannot be computed per festival, the response numbers indicate relatively low engagement with the survey. The numbers above reflect the valid responses after a very small number of abusive and inconsistent responses (all from the general public survey) were removed. The self-selected nature of the sample further emphasises that the results must be interpreted cautiously.

EVIDENCE FOR EACH ATTRIBUTION PROPOSITION

STUDENTS

In relation to the **first attribution proposition**, the survey data revealed that students were very positive of their experiences engaging with RSF (Figure 1). All respondents agreed or completely agreed that the festival had offered them the opportunity to learn something new and 95% agreed or completely agreed that the festival had changed their mind about how they could learn science.

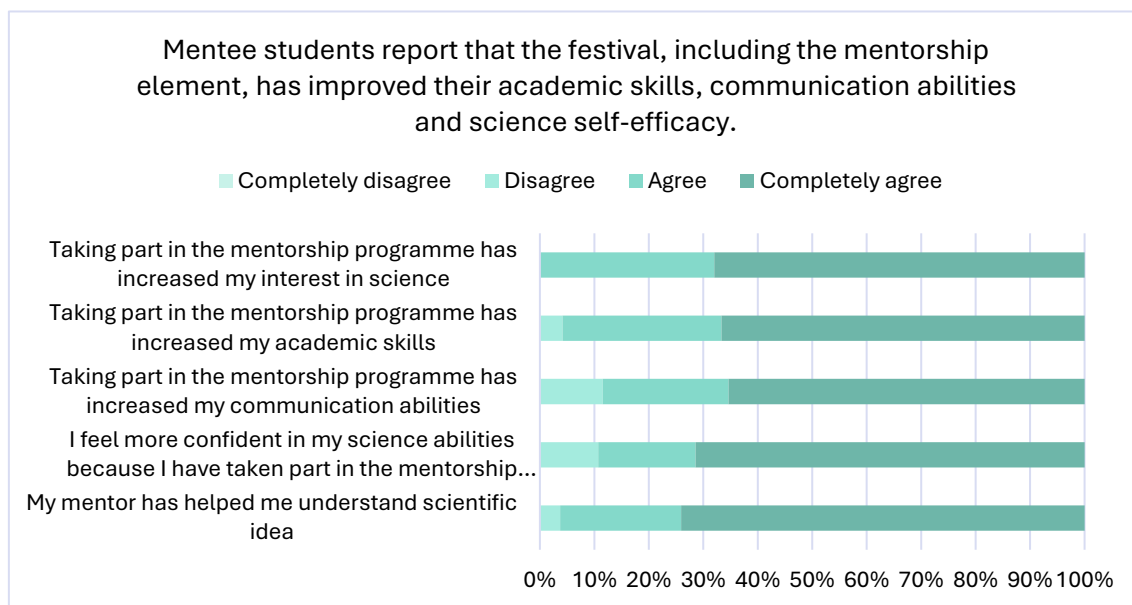
Figure 1



Overall, the evidence provides strong support for proposition one.

The **second attribution proposition** relates to mentee students in particular. Figure 2 below illustrates that a large majority of mentee students (above approximately 90% for all questions) agreed or completely agreed that the festival, including the mentorship element, improved their skills and science self-efficacy. The highest level of agreement was reported in relation to the festival increasing students' interest in science, a key overall aim.

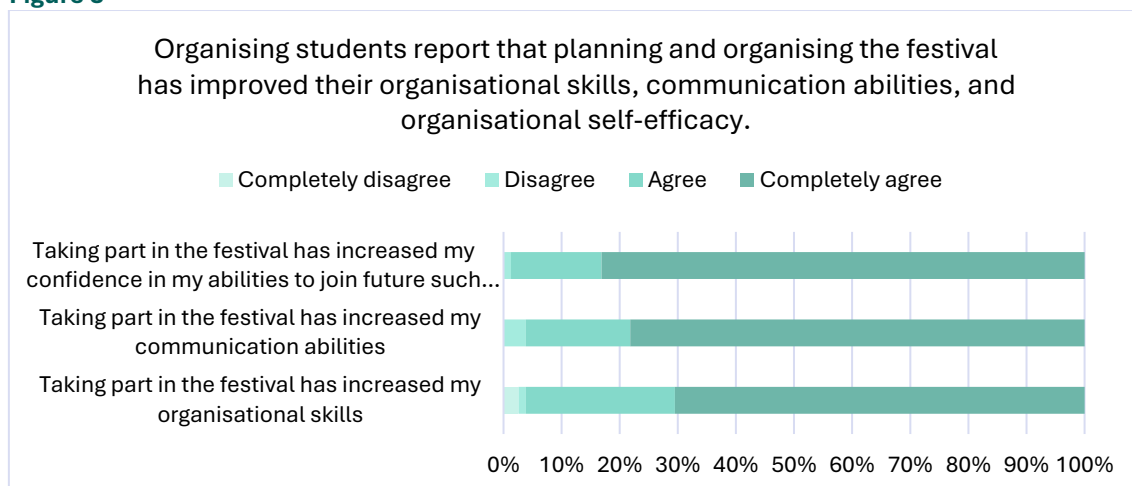
Figure 2



There is therefore good support in the evidence for proposition two.

The **third proposition** focuses on organising students. While the rate of agreement was slightly lower than for mentee students, over 80% of respondents agreed or completely agreed that their experience in the festival (planning and organising) had increased their organisational skills and communication abilities, as well as their overall organisational self-efficacy (captured through a question asking about future engagement in similar projects). Figure 3 below shows that this latter question had almost perfect agreement, with over 96% of respondents agreeing or completely agreeing.

Figure 3



Proposition three therefore also receives support from the evidence.

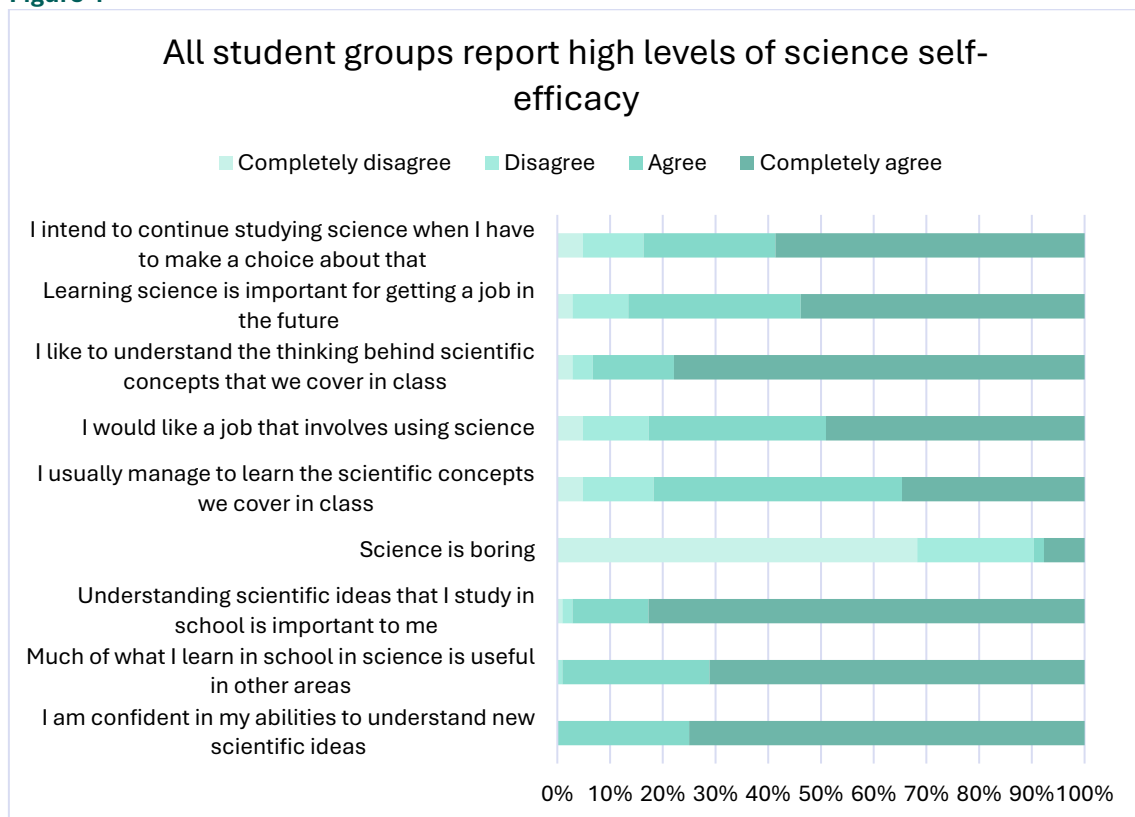
The **fourth attribution proposition** is the final one to refer to student stakeholder groups and includes all students and their overall science self-efficacy. Results for the set of questions capturing science self-efficacy, as illustrated in Figure 4, are somewhat more mixed than for the previous questions.

Students are on the whole confident in their abilities to understand scientific concepts (100% agree or completely agree with this statement), however when asked about the scientific concepts covered during their school lessons, responses are less positive. Just under 20% of respondents report that they do not usually manage to learn the scientific concepts discussed in class (disagree and completely disagree with this statement) and just under 10% of respondents do not report a desire to understand the scientific reasoning behind what they learn in class.

Students acknowledge that what they learn in school in science is useful in other areas (over 95% agree or completely agree), although 10% believe that science is boring. This latter question was asked to capture strong feelings which might otherwise not be reported by students and avoid social desirability bias.

In terms of a future science focus, over 80% of students intend to continue studying science when the time for that choice comes (agree or completely agree). A similar proportion would like a job that involves using science, with the proportions of students completely disagreeing with these statements below 5%.

Figure 4



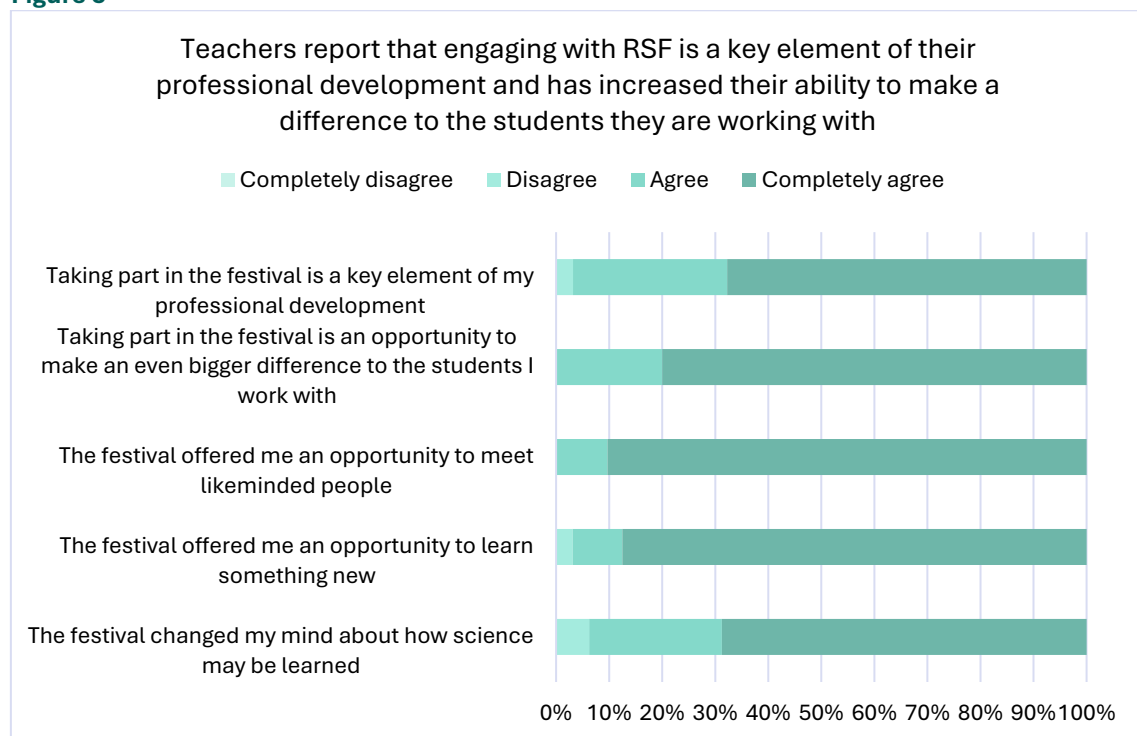
The above data therefore provides moderate to strong support for the fourth proposition.

TEACHERS

The **fifth attribution proposition** reflects teachers' perceptions of their engagement with RSF and responses to relevant questions are illustrated in Figure 5. Over 95% of teachers report that RSF is a key element of their professional development and all teachers agree or completely agree that their participation enables them to increase the difference they make to the students they work with.

Teachers also report that participation in RSF enabled them to meet likeminded individuals (100% agree or completely agree), and to learn new things (96% agree and completely agree). This latter result suggests that there is potential for even more learning amongst teachers given that even the small proportion of teachers who had previously engaged with the festival report this.

Figure 5



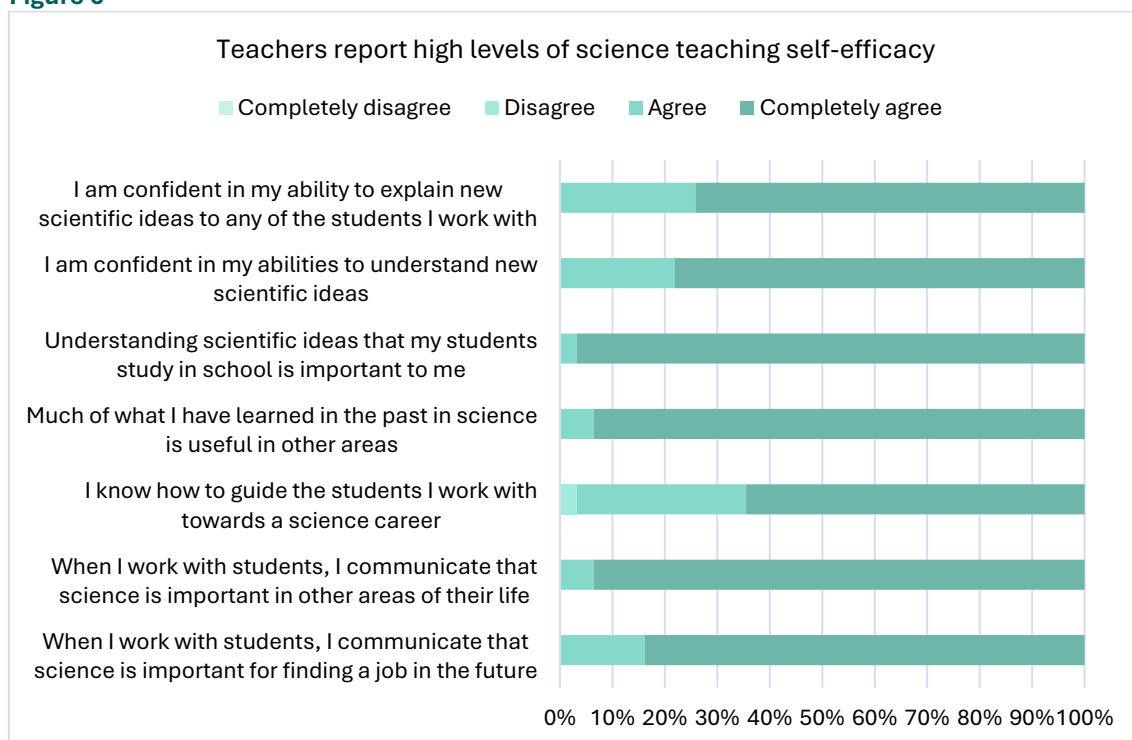
Overall, therefore, the evidence strongly supports this teacher-related attribution proposition.

The **sixth attribution proposition** is also focused on teachers and captures their science teaching self-efficacy with a set of questions that mirror those asked of students but adapted for the science teaching perspective.

Figure 6 shows high reported levels of confidence in teachers' own abilities to convey scientific concepts to students, to guide their science careers and similarly positive answers in terms of communicating the value of science to students.

Teachers' responses to this set of questions offers the highest levels of agreement and complete agreement from across all surveys and stakeholder groups, again suggesting RSF is addressing an existing and pressing need.

Figure 6

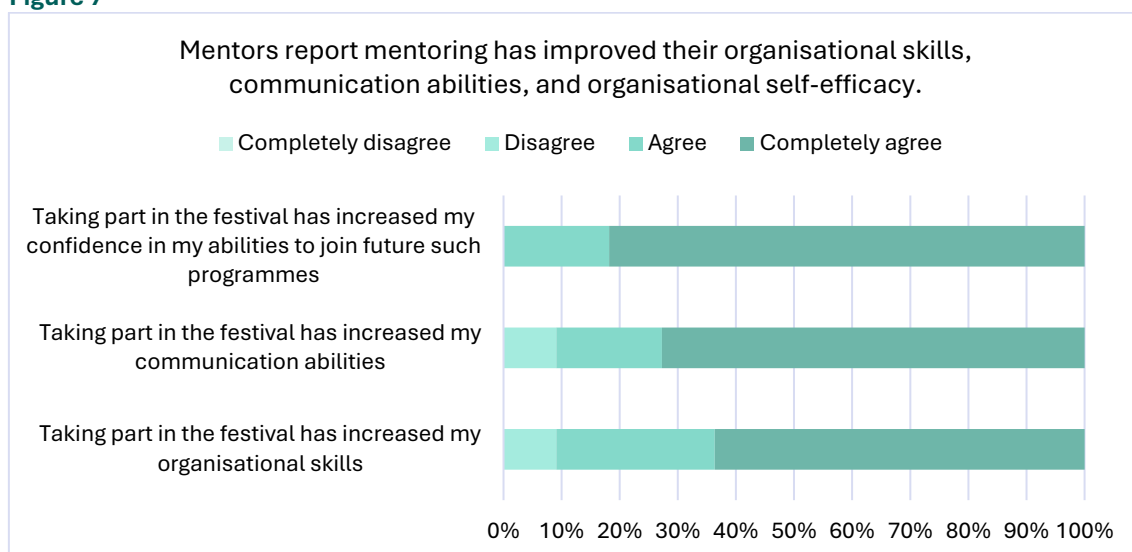


The evidence in relation to teachers' science teaching self-efficacy is very strongly supportive of this attribution proposition.

MENTORS

The next two propositions centre on mentors. **Attribution proposition seven** focuses on mentors' self-reported outcomes from having engaged with RSF. Figure 7 below illustrates that at least 90% of mentors agree or completely agree that RSF engagement has increased their communication abilities, organisational skills, and self-efficacy.

Figure 7

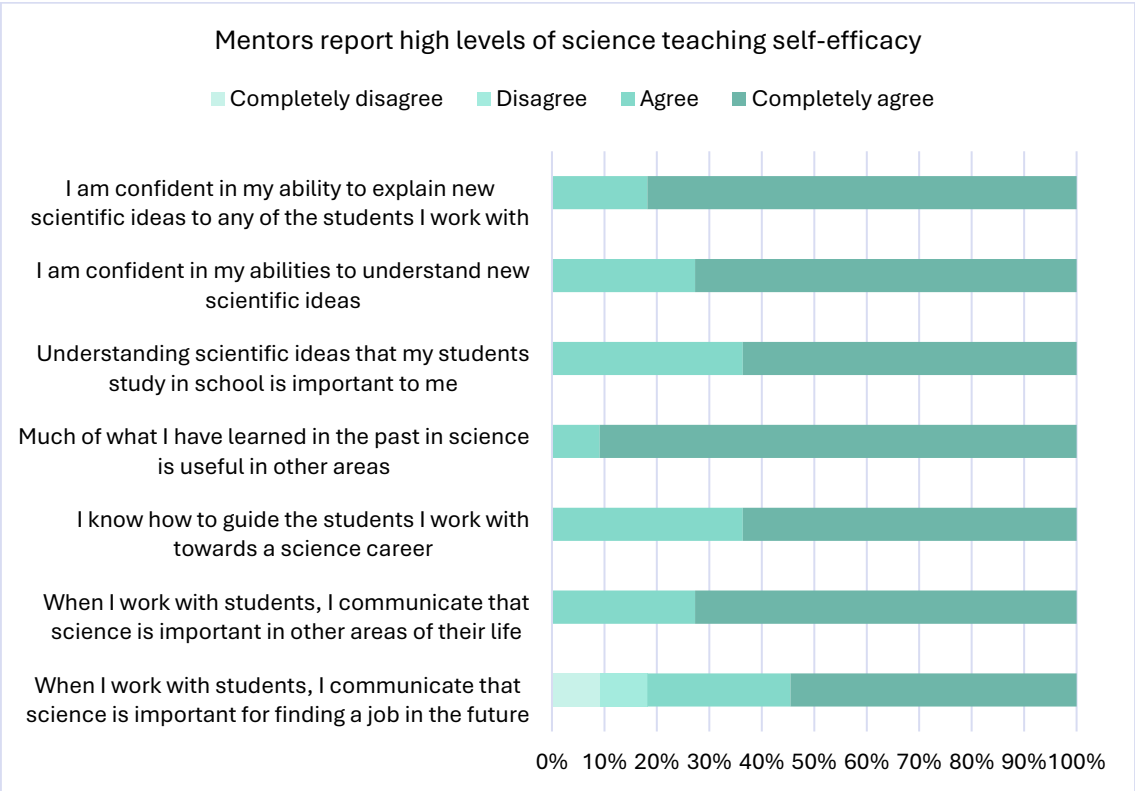


This evidence provides strong support of this proposition.

Similar to teachers, mentors were also asked about their science teaching self-efficacy. In this context, ‘teaching’ is understood in the sense of communicating scientific ideas and principles rather than classroom pedagogy, and questions reflected this. **Attribution proposition eight** therefore relates to mentors’ science teaching self-efficacy, broadly understood.

As shown in Figure 8 below, mentors offered slightly more varied responses to this set of questions compared to other stakeholder groups, but responses still show strong and consistent agreement in particular with statements that capture mentors’ confidence to explain scientific concepts (100% agree or completely agree) and mentors’ abilities to guide students towards science careers (100% agree or completely agree).

Figure 8



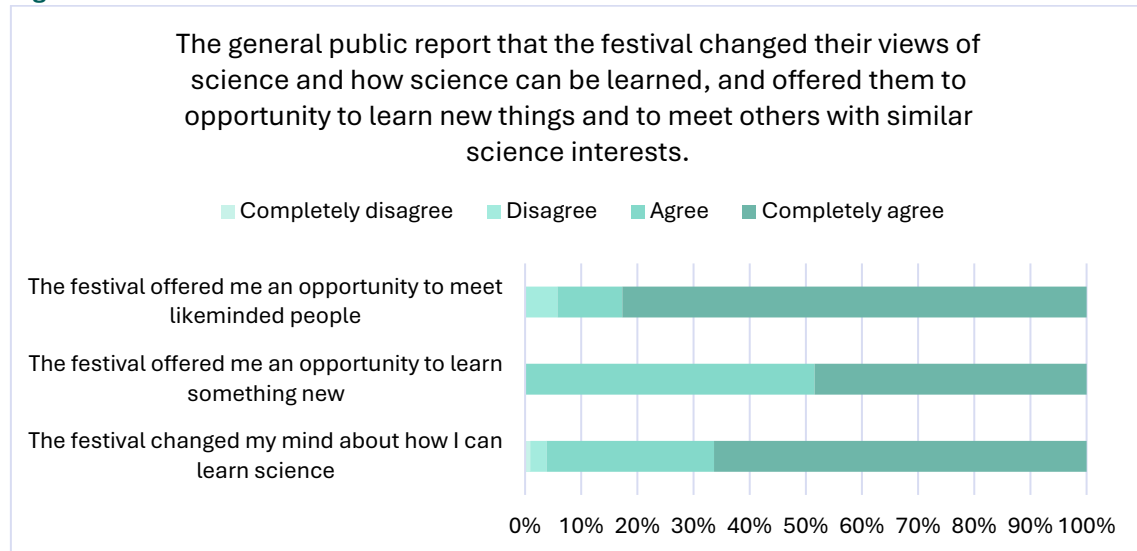
While there is some variation in mentors’ responses, specifically around the importance of science for finding future jobs, overall there is moderate to strong evidence in support of this proposition.

GENERAL PUBLIC

The final two attribution propositions relate to the general public, as this reflects RSF’s overall aims, which also include social and educational system change including through on-the-day festival engagement.

Attribution proposition nine focuses on the perceived impact of the festival on attendees' (members of the general public not otherwise engaged with RSF). Figure 9 below shows that all attendees reported the festival had offered them an opportunity to learn something new, while over 95% of respondents agreed that the festival had changes their mind about how they can learn science. Responses in relation to the festival offering an opportunity to meet likeminded individuals were similarly positive.

Figure 9



The evidence above therefore provides support to this proposition.

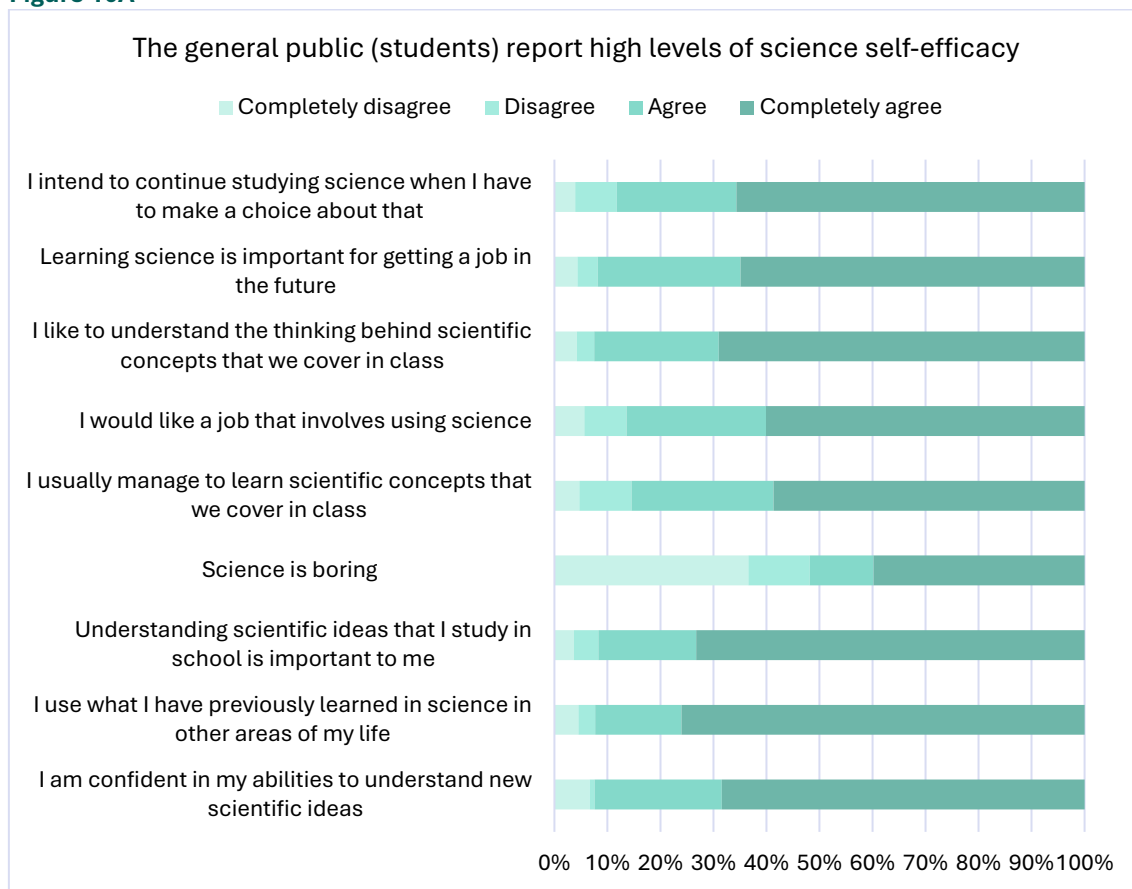
Finally, **attribution proposition ten** captures general attitudes towards science, construed as science self-efficacy in the broadest sense. To ensure consistency and comparability, the same questions were asked of members of the general public as to the groups of stakeholders directly engaging with RSF.

While results are presented for the full sample of members of the general public above, insights are disaggregated by group for the set of questions referring to science self-efficacy, as they vary meaningfully between these groups. As Figures 10A and 10B below illustrated, students report stronger agreement with this set of statements compared, overall, to parents, teachers, and other members of the general public.

Specifically, as Figure 10A shows, student attendees to the festival are positive in their assessment of their own ability to learn scientific concepts in school (over 90% agree or completely agree). This is slightly more positive compared to students who actively engage with RSF, but it may be the case that RSF direct participants are better aware of the depth of understanding of scientific concepts required for learning and may be more critical of their own abilities.

In a very similar vein to students directly engaging with RSF, over 90% of festival student attendees would like a job in science and intend to make science-oriented choices in the future.

Figure 10A

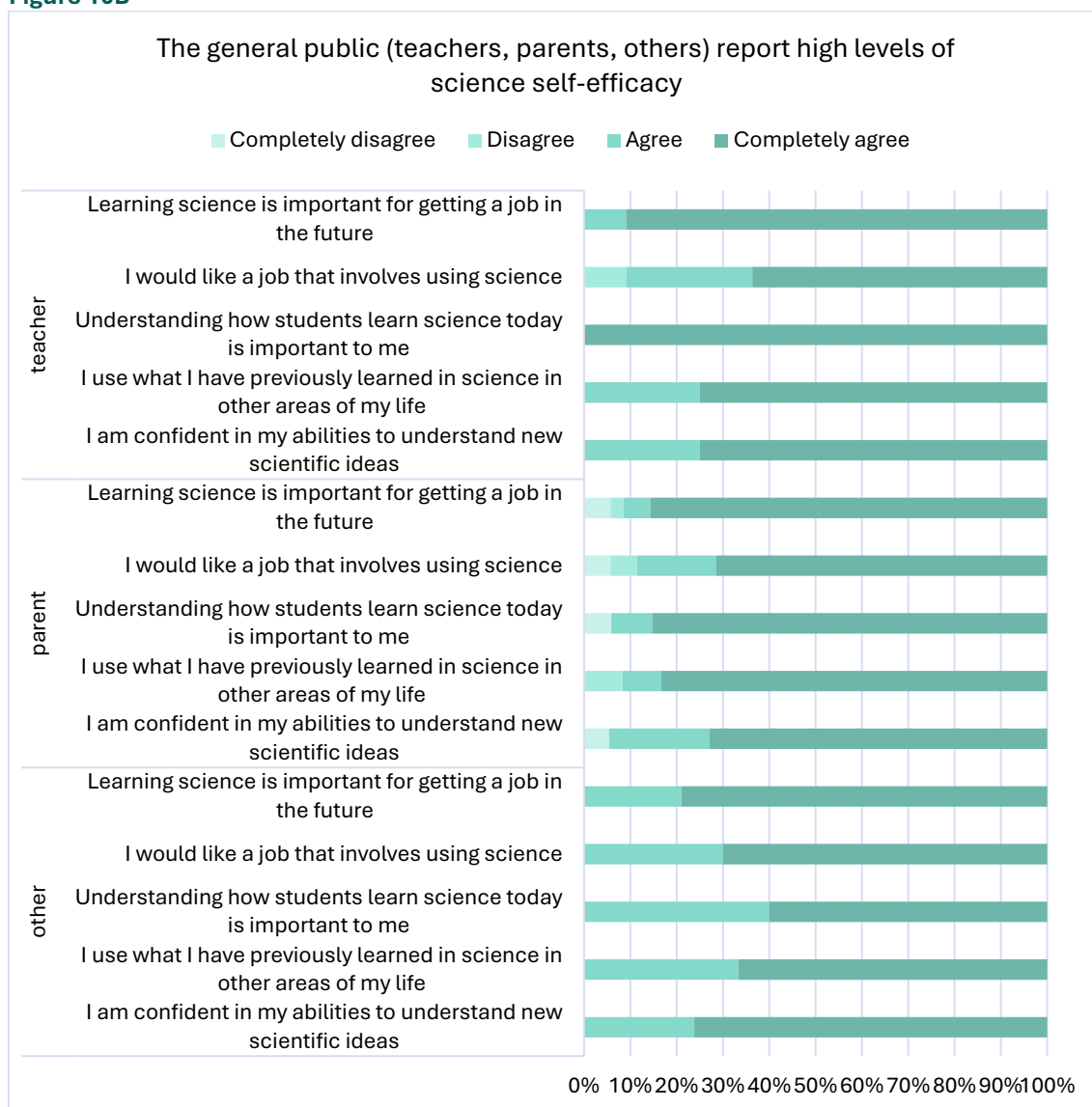


Teachers and other members of the general public show very similar response patterns, both to student attendees and to teachers directly engaged in RSF (Figure 10B below). Comparatively, parent attendees offer a more mixed range of responses.

This is particularly evident in relation to parents' reports that science is required for a good job in the future, and their responses in relation to their understanding of what scientific concepts students learn in school.

This suggests that there is scope yet for the improvement of such attitudes from parents.

Figure 10B



The data therefore provides moderate to strong support to this attribution proposition.

CONCLUSIONS AND RECOMMENDATIONS

SUMMARY OF APPROACH AND INSIGHTS

This light-touch evaluation of the Romanian Science Festival using a contribution analysis approach provides strong evidence that RSF is achieving its core aims and operating in ways consistent with its theory of change.

The contribution analysis approach examined ten attribution propositions, derived from RSF's theory of change and relevant to the key stakeholder groups: students (mentees and organisers), teachers, mentors, and the general public.

Data was collected through online surveys with each of the key stakeholder groups around the flagship RSF events (the festivals), posing questions that related to each of the attribution propositions.

The collected data suggests that RSF is successfully promoting non-formal science education, connecting the Romanian scientific diaspora to local educational spaces, and acting as a platform to convene people and organisations with an interest in science.

Against the RSF outcomes that the initiative's theory of change identifies, the evidence reveals consistently positive results across all stakeholder groups. Students engaging directly with RSF (either as mentees or as festival organisers) report that the festival has changed their views of science and how science can be learned, with all respondents agreeing that it offered opportunities to learn new things.

Specifically, mentee students show particularly strong agreement that the mentorship element improved their academic skills, communication abilities, and science self-efficacy, with over 90% positive responses across all measures. Organising students similarly report enhanced organisational skills, communication abilities, and organisational self-efficacy, with over 95% expressing confidence in future engagement with similar projects.

Similarly, teachers report exceptionally high levels of engagement with RSF, with all teachers agreeing that participation enables them to increase the difference they make to their students, and over 95% reporting that RSF is a key element of their professional development. Teachers also exhibit very high levels of science teaching self-efficacy, providing the strongest levels of agreement across all stakeholder groups surveyed. This suggests that RSF is addressing existing and pressing professional development needs within the Romanian educational system.

Although responses are small in number, mentors from the Romanian scientific diaspora report strong positive outcomes from their engagement, with at least 90% agreeing that RSF participation has increased their communication abilities, organisational skills, and self-efficacy. Their science teaching self-efficacy levels are also high, particularly in their confidence to explain scientific concepts and guide students towards science careers, where 100% agreement was observed.

The general public stakeholder group shows positive responses, particularly among student attendees who report high levels of science self-efficacy comparable to direct RSF participants. However, the data reveals some variation for non-student members of the general public who attended the festivals, with parents showing more mixed responses, particularly regarding the importance of science for future employment and their understanding of scientific concepts taught in schools. This suggests scope for improvement in parental attitudes towards science, and potentially a role for RSF to play within that.

The survey data, while drawing on a self-selected sample and requiring cautious interpretation, provides moderate to strong support for all ten attribution propositions. The consistency of positive responses across different stakeholder groups and different

aspects of RSF engagement indicates that the initiative's mechanisms of change are observable empirically.

The limitation of this light-touch evaluation approach rests in the inability to isolate the impact of RSF – other evaluation approaches may offer richer insights into the changes occurring for all stakeholder groups due to RSF, as opposed to any other programme or initiative.

Despite this limitation, the evidence in its totality suggests that RSF is successfully translating its inputs and activities into the desired short-term outcomes outlined in its theory of change.

It remains to be seen how the medium/longer-term outcomes are realised. Wider engagement beyond the stakeholder groups identified and engaged in this report will be needed for that.

RECOMMENDATIONS

Several recommendations emerge from this evidence.

First, RSF may consider the resilience of its model. While this report did not directly address local organising team's efforts (beyond any responses provided by individuals who were also part of the stakeholder groups above), since the initiative relies on volunteer work, a long-term sustainability plan may be beneficial to its continuation and possibly growth.

Second, RSF may consider embedding sustainability within its mentorship activities and networks to ensure long-term impact. The initiative may also benefit from greater articulation and clarity around the role of schools and teachers, with clearer outcomes defined for this stakeholder group. There is a clear indication in the data that teachers are benefiting from RSF – however, this relies on levels of individual engagement, and it may be the case that a more structured approach may offer teachers even further professional development opportunities around science. Similarly, the more mixed responses from parents in the general public suggest that targeted efforts to engage this group more effectively may enhance RSF's overall impact on societal attitudes towards science.

CONCLUSION

This light-touch evaluation suggests that RSF is making meaningful progress towards its long-term vision of creating a scientifically literate Romanian society where young people and the general public are inspired to pursue careers in science. The evidence strongly supports the conclusion that RSF has contributed to the positive outcomes reported by each stakeholder group, thereby addressing the central attribution problem guiding this evaluation.

The University of Cambridge is committed to high standards of research integrity, including ethical approval for research and transparency.

This research underwent ethical review via the Faculty of Education University of Cambridge.

The views expressed here do not constitute endorsement by the University of Cambridge of any organisation, programme, or initiative.

The views expressed here may be attributed to the research team carrying out the research.

The lead researcher for this project was Sonia Ilie, isi22@cam.ac.uk.