Science and Me

JM Johnson Matthey
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MACEDONIA 2025
Helping Build a Stronger Nation

From Training to Classroom Change

A Short Impact Analysis and a Three Years of Impact from the “**Science and Me**” Project

Skopje, July 2026

Core policy message

The 2025/2026 cycle of program implementation generated a clear positive trend in teacher confidence and in the regular use of practical, inquiry-based and student-centered teaching. Forty-two teachers were trained, with an estimated classroom reach of approximately 6,500 students, and directly engaged more than 1,050 students through three regional science fairs. Viewed across three implementation cycles, the evidence shows an evolution from a successful training pilot toward a broader support model combining mentoring, provision of science tools, classroom application, science fairs, and exposure to real-world science.

Results at a glance

+5.9%	+6.3%	+13.8 pp	4.72/5
average teacher confidence	average classroom-practice frequency	responses in the highest confidence category	overall satisfaction with project components

Evidence base: baseline survey of 42 participating teachers and post-intervention survey of 26 teachers who completed the training. The comparison is group-level and does not link individual records.

Key findings

Teacher confidence increased from 3.47 to 3.68 on a four-point scale. The proposed 10% increase in the average index was not fully reached, but maximum-confidence responses rose by 13.8 percentage points.

Classroom-practice frequency increased from 3.06 to 3.25 on a four-point scale. Practices reported in every or almost every lesson rose from 36.7% to 47.8%.

The strongest changes were closely aligned with the project model: motivating students with limited interest, differentiating instruction and tasks according to students' needs, applying project-based learning, supporting scientific research and experimental interpretation, and increasing the use of field visits and external experts. Teachers reported increased student curiosity, participation, teamwork and confidence, although the student attitude and career-intention changes were not measured directly.

Strong satisfaction and 100% willingness to participate again indicate that the motivation of teachers was not just sustained, but also reinforced. Though the motivation target cannot be quantified because the full baseline motivation scale was not repeated in the post-survey.

Across the three cycles, the project evolved from training-led support into a more complete implementation model. Mentorship became a central bridge between workshops and classroom application: in 2025/2026, 93.8% of valid ratings on both the mentee and mentor questions were satisfied or very satisfied.

The 2025/2026 implementation footprint was substantial: 42 teachers trained, approximately 6,500 students reached through their classroom experience, 154 student presenters from 27 schools, more than 1,050 fair participants and visitors, and 30 Johnson Matthey employees contributing more than 40 volunteer days.

1. The policy challenge

Improving science education requires more than introducing new curricula or providing one-off teacher training. Teachers need practical methods, usable materials, professional guidance and opportunities to apply new approaches with students. Without these supporting conditions, teachers' confidence may increase without translating into meaningful changes in classroom practice.

The **"Science and Me"** project addressed this implementation gap through a combined intervention: professional development workshops, mentoring, science sets, classroom activities, regional science fairs and exposure to real-world science and industry. This short analysis examines the main results and lessons emerging from three years of project implementation.

Why this matters for policy?

The results suggest that teacher development is most effective when professional learning is connected to materials, mentoring and visible opportunities for application. This has implications for the design of national teacher-development programs, school support, public-private partnerships and future Science, technology, engineering and math (STEM) initiatives.

2. Evaluation design and interpretation

The baseline survey was administered at the start of the program i.e. professional development workshops (November 2025). The post-intervention survey was administered in May-June 2026, after the completion of the training, mentoring, classroom implementation, science fairs and the remaining project activities. The same core confidence and classroom-practice questions were repeated.

Survey wave	Sample	Interpretation
Baseline	42 participating teachers	Before training and project support
Post-intervention	26 teachers	End of the academic year, after completion of project activities
Comparison	Unpaired group averages	Measures the average direction of change, not individual change

Source: Macedonia2025 pre- and post-intervention teacher surveys, 2025/2026.

Because the two samples are not identical and no control (comparison) group was used, the results should be interpreted as evidence of a positive project contribution rather than proof that every observed difference was caused exclusively by the project.

3. Comparative results

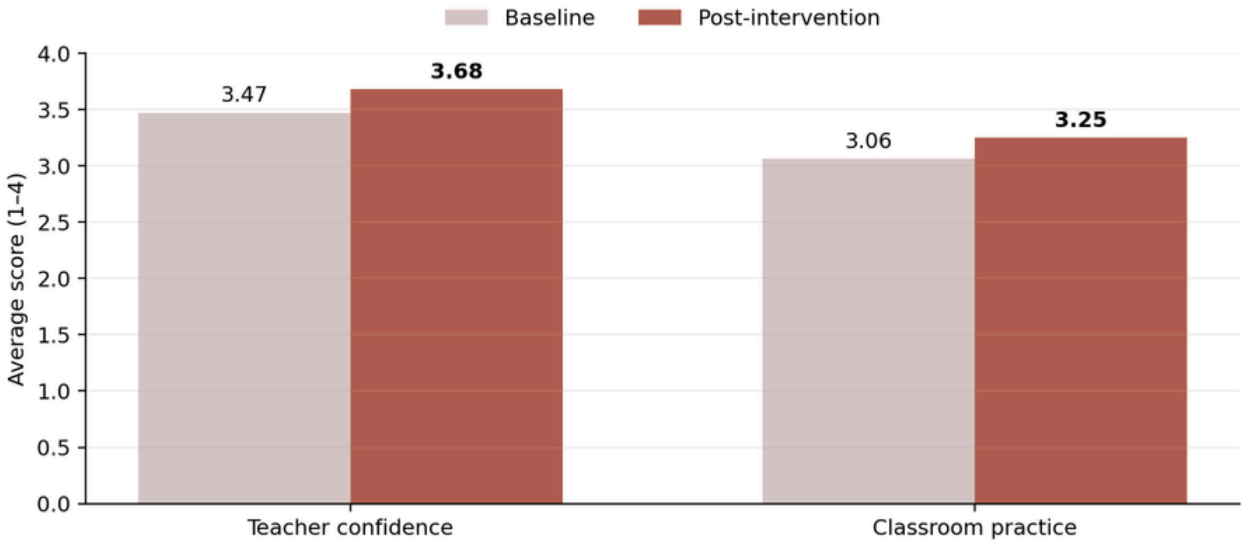

Figure 1. Average confidence and classroom-practice scores before and after the intervention. Both scales range from 1 to 4.
Source: Survey administered by the Macedonia2025 project team.

Overall change

Indicator	Baseline	Post	Absolute change	Relative change
Overall teacher confidence	3.47	3.68	+0.20	+5.9%
Highest-category confidence responses	57.4%	71.2%	+13.8 pp	—
Overall classroom-practice frequency	3.06	3.25	+0.19	+6.3%
Practices used in every/almost every lesson	36.7%	47.8%	+11.1 pp	—

Note: "pp" means percentage points. Relative change is calculated for average index scores only.
Source: Survey administered by the Macedonia2025 project team.

The average confidence index increased by 5.9%, below the proposal target of at least 10%. However, the proportion of responses in the maximum confidence category increased by 13.8 percentage points. This indicates a meaningful strengthening of confidence despite the limited room for improvement created by an already high baseline score of 3.47 out of 4.

Classroom practices also moved in a positive direction. The increase was visible not only in the average score but in the frequency distribution: more practices shifted from occasional or "most lessons" use into use in every or almost every lesson.

4. Where the strongest changes occurred

Teacher confidence

Confidence indicator	Baseline	Post	Change
Motivating students with limited interest	3.18	3.65	**+0.48**
Differentiating tasks by student needs	3.40	3.77	**+0.37**
Encouraging belief in learning and progress	3.45	3.81	**+0.36**
Managing inappropriate behaviour	3.18	3.50	**+0.33**
Helping students think critically	3.35	3.65	**+0.30**
Using project-based learning	3.30	3.58	**+0.28**

All confidence indicators use a four-point scale.

The strongest improvement was in motivating students with limited interest - an important result because student disengagement was one of the most common baseline barriers. Improvements in differentiation and behaviour management suggest that the project strengthened teachers’ capacity to use practical and group-based activities with diverse learners.

Inquiry, practical learning and external exposure

Classroom practice	Baseline	Post	Change
Field visits	2.18	2.73	**+0.56**
Guest lecturers or external experts	2.03	2.50	**+0.48**
Scientific research by students	2.60	2.96	**+0.36**
Students drawing experimental conclusions	3.30	3.62	**+0.32**
Projects lasting at least one week	2.75	3.04	**+0.29**
Laboratory reports	2.75	3.00	**+0.25**

All classroom-practice indicators use a four-point frequency scale.

These changes are closely aligned with the intervention. Science fairs, the factory visit, mentoring and the science sets created concrete reasons and opportunities to use experimental, research-based and outward-facing science education. Field visits and external experts remained less frequent than ordinary classroom activities, as expected, but recorded the largest increases.

5. Broader outcomes and target assessment

Proposed outcome	Evidence	Assessment
Positive shift among approximately 2,000 students	The 42 trained teachers represented an estimated classroom reach of approximately 6,500 students, while the three fairs directly engaged more than 1,050 students. Teacher and student testimonials indicate increased curiosity, participation and confidence, but no direct student pre–post attitude survey was administered.	**Reach exceeded; attitude shift qualitatively supported**
Teacher confidence: at least +10%	Average index increased by 5.9%; highest-category responses increased by 13.8 percentage points.	**Strong progress; still the target not fully reached**
Teacher motivation: at least +5%	High satisfaction, strong qualitative feedback and 100% willingness to participate again, but the full motivation scale was not repeated.	**Likely reinforced; not quantitatively verified**
Deeper student engagement with science	More frequent research, projects, experiments, conclusions, reports, field visits and expert engagement.	**Largely supported by teacher evidence**
Interest in science-related careers	Factory and real-world science exposure increased awareness; student career intentions were not measured directly.	**Initial evidence only**

2025/2026 implementation footprint

Delivery area	2025/2026 result	Why it matters
Teacher development	**42 teachers trained**	10 rural and 32 urban teachers; approximately 6,500 students reached through their regular teaching
Regional science fairs	**3 fairs; more than 1,050 students reached**	154 student presenters from 27 schools and more than 900 audience members
Girls in science	**120 of 154 presenters**	Approximately 78% of student presenters were girls
Science resources	**19 science sets distributed**	15 sets to urban schools and 4 to rural schools, supporting continued practical work
Industry exposure	**2 Johnson Matthey plant study visits**	More than 30 students from 6 schools observed laboratories, production and applied STEM careers
Employee volunteering	**30 Johnson Matthey employees**	More than 40 volunteer days, in addition to planning and organizational support
Science communication	**18 campaign contributions**	Including 5 Johnson Matthey representatives; newsletters distributed to more than 6,800 contacts

Source: Macedonia2025 project implementation records and Impact Assessment, 2025/2026. Classroom reach is an estimate based on teachers' reported student populations; event figures represent recorded participation and attendance.

These implementation statistics show that the project combined depth and reach. The teacher-training component created a broad potential classroom influence, while the fairs and study visits provided more intensive direct experiences. The particularly high participation of girls among student presenters is encouraging, although it should be interpreted as participation evidence rather than proof of a change in gender attitudes or long-term STEM choices.

What the additional post-intervention evidence shows

Overall satisfaction with the principal project components was 4.72 out of 5. 92.3% described the training as very useful; all respondents described it as useful or very useful.

Among valid mentoring ratings, 93.8% were satisfied or very satisfied. Teachers valued practical advice, feedback, emotional support, joint lesson and experiment planning, and help with preparing students for the science fairs. At the same time, four respondents reported that mentoring had not been implemented and one reported insufficient guidance, showing the need for clearer structure and follow-up.

100% of recipients of science sets gave a positive assessment of their usefulness.

100% would participate again and 96.2% would recommend participation to another teacher.

Student-facing delivery was substantial: 154 students presented projects, more than 900 attended as audience members, and more than 30 students participated in industry visits.

Across the three project years, approximately 2,600 students attended ten regional science fairs in different parts of Macedonia.

Balanced interpretation

The evidence is strongest for teacher confidence, classroom practice and satisfaction. Evidence of student attitude and career-intention change is promising but indirect and indicative because it is based on teacher observations rather than a direct student pre-post survey. Motivation appears to have been sustained and reinforced, but the 5% target cannot be calculated from the available data.

Mentorship: turning training into sustained practice

Within the program, mentorship consisted of: i) support during the workshops and ii) longer-term assistance for classroom application of the new knowledge. In 2025/2026, experienced teachers in biology, chemistry, physics, geography, general science and classroom education supported less-experienced colleagues throughout the academic year. Their role included adapting new methods to actual classroom conditions, planning experiments and projects, addressing classroom challenges, checking scientific accuracy, selecting materials, organizing student teamwork and preparing students to present confidently at the regional science fairs.

This element is important because it connects professional development with implementation. The survey findings suggest that mentoring strengthened confidence, encouraged professional reflection and created a channel for peer exchange. Mentors also reported benefits for their own practice, indicating that the relationship can function as reciprocal professional learning rather than one-way supervision.

Mentorship indicator	Evidence	Interpretation
Evolution across cycles	No formal mentoring in 2023/2024; 10 experienced mentors introduced in 2024/2025; expanded subject and classroom-teacher mentoring with year-round guidance in 2025/2026.	The project moved from one-off training towards sustained professional support.
Mentee experience, 2025/2026	12 very satisfied, 3 satisfied and 1 partly satisfied among 16 valid ratings: 93.8% satisfied or very satisfied.	Strong perceived value among teachers who experienced an active mentor relationship.
Mentor experience, 2025/2026	The mentor question produced the same distribution among 16 valid ratings: 93.8% satisfied or very satisfied.	Mentoring supported mentors' reflection and professional learning as well as mentee development.
Implementation consistency	Four respondents stated that mentoring had not been implemented, and one reported that the relationship did not provide sufficient guidance.	Mentoring should remain a core component, but with minimum contact requirements, monitoring and early corrective support.

Note: Mentoring questions were not completed through fully consistent skip logic, and some respondents answered both the mentor and mentee items. The percentages therefore describe valid ratings rather than distinct groups of participants.

MENTOR VOICE

"The cooperation helped the trainee teacher face classroom challenges more easily, while also enabling me to reflect critically on my own practice. The project was not merely a collection of activities, but a comprehensive platform for professional growth."

Teacher-mentor, 2025/2026 project evaluation

6. Three-cycle comparison and cumulative impact

The 2023/2024, 2024/2025 and 2025/2026 cycles were not identical: participant profiles, project components and some survey formulations (collected information) evolved over time. The comparison below therefore follows a line of recurring indicators and implementation themes rather than treating every percentage as a strictly equivalent year-on-year measure. The value of the comparison lies in showing whether positive practices were initiated, sustained and deepened across successive cycles.

Indicator	2023/2024	2024/2025	2025/2026
Post-intervention teacher respondents	19	25	26
Training satisfaction	79% completely satisfied	92% completely satisfied	76.9% gave 5/5 for knowledge; 92.3% gave 5/5 for practical activities
Hands-on experiments and practical work	Self-assessed ability rose from 42% to 73.7%	Regular use reported in most classrooms	96.2% frequently used demonstrations/experiments; 76.9% frequently assigned practical work
Use of real-world examples	52.6% to 78.9% after training	Consistently integrated across lessons	100% reported frequent use
Student scientific research	Not reported in the same format	Mean increase of +0.448	Mean increase of +0.36
Field visits / external experts	Rare practices identified for development	Mean increases of +0.285 / +0.420	Mean increases of +0.56 / +0.48
Mentoring	Not included	Introduced; 96% rated it as excellent or very good	93.8% satisfied or very satisfied among valid ratings; implementation uneven in some pairs
Science sets and practical resources	Resource support initiated	21 recipients; 100% reported active, positive use	18 identifiable recipients; 100% gave positive assessment
Regional science fairs and reach	4 fairs; more than 800 students reached	3 fairs; 125 presenters from 19 schools; more than 1,200 students directly impacted	3 fairs; 154 presenters from 27 schools; more than 1,050 students reached
Industry and volunteer engagement	Initial Johnson Matthey participation and volunteering	JM Factory and university visits expanded real-world exposure	2 factory visits for more than 30 students; 30 employees contributed more than 40 volunteer days

Sources: Macedonia2025 evaluation surveys and policy brief, 2023/2024–2025/2026. Some indicators use related, rather than identical, survey formulations; figures should be read as a trajectory of implementation and impact.

Summary of cumulative impact

The project progressed from a proof-of-concept training model in 2023/2024 to a more integrated teacher-support ecosystem in 2024/2025 and 2025/2026.

Practical science teaching became increasingly practiced by teachers. By 2025/2026, experiments, demonstrations and real-world examples were reported as regular classroom practices by most respondents.

Inquiry-based learning continued to deepen. Student scientific research increased in both the 2024/2025 and 2025/2026 pre–post comparisons, while project work, laboratory reporting and experimental interpretation also became more frequent.

The project increasingly connected schools with a wider science ecosystem. Field visits and external experts recorded the largest 2025/2026 practice increases, building on earlier science-fair and industry-engagement efforts.

Mentoring and science sets were consistently valued, but the latest cycle shows that mentoring quality depends on clear structure, minimum contact expectations and active follow-up.

Training satisfaction remained high across all three cycles. The 2025/2026 cohort rated the knowledge component less uniformly at the maximum level than the previous cohort, while practical activities retained a 92.3% maximum rating and overall project satisfaction reached 4.72 out of 5.

Ten regional fairs across the three cycles attracted approximately 2,600 students, creating a visible and recurring national platform for student-led science.

The latest cycle widened the implementation network: 27 schools took part in the fairs, 120 girls presented projects, and 30 company volunteers helped connect classroom learning with scientific and industrial practice.

Impact trajectory

Evidence from 2023/2024 suggests that teachers were receptive to practical and inquiry-based methods. In 2024/2025 the model was broadened through formal mentoring and wider resource use. The approach was consolidated in 2025/2026, when 42 teachers were trained, 27 schools participated in regional fairs, and the survey results demonstrated group-level gains in confidence and classroom implementation. Across three years, ten fairs reached approximately 2,600 students. The cumulative evidence supports continuation, but also calls for more consistent mentoring and stronger direct measurement of student outcomes.

Teacher voices behind the results

"My students felt like real scientists. They asked when the next event would be and already had ideas for future projects." **Teacher, Radovish**	*"The training was practical, interactive and filled with useful ideas that can be applied in teaching. Some activities and experiments can also be adapted for our students."* **Special educator, resource-center school**
"The best part was that theory gained practical meaning and became an incentive for students. Science in practice creates lasting knowledge." **Teacher**	*"The scientific laws we study in the classroom gained a new dimension - they became applicable."* **Teacher following the Johnson Matthey visit**
"Every young teacher needs a mentor who will guide them, support them and celebrate their progress."**Teacher reflection**	"The mentoring process was the foundation of the activities. It helped the trainee colleague address teaching challenges and helped me reflect critically on my own practice."**Teacher-mentor**

Illustrative testimonials from project evaluations. Current-cycle statements were translated from Macedonian and lightly edited for clarity; they provide context but are not a substitute for quantitative evidence.

"The fair awakened a love for science and encouraged creative thinking. Through curiosity and research, we can discover many things about the world around us." **Student participant, Skopje - regional science fair**	"Science becomes very interesting when you apply it in practice. I also learned how important it is to cooperate as a team." **Student presenter, Skopje - regional science fair**
"This experience made me feel like a young scientist and inspired me to continue on the path of science with greater passion and self-confidence." **Student presenter - regional science fair**	"The plant visit was very educational because I understood how knowledge can be applied in practice. I will remember this experience for the rest of my life." **Student participant - Johnson Matthey plant study visit**

Student testimonials are drawn from the 2025/2026 impact assessment and were translated from Macedonian and lightly shortened for policy-brief presentation. They illustrate perceived experience and should be read alongside the quantitative evidence.

7. Policy implications

Professional development should be designed as a process, not an event. The mentoring evidence shows why: workshops introduced methods, but year-round peer support helped teachers adapt them to real classrooms, develop experiments and projects, solve implementation problems and prepare students for public presentation. Mentorship should therefore be treated as a core delivery mechanism rather than an optional add-on.

Practical resources are part of teacher-development policy. Confidence alone cannot produce impactful science teaching supported by experiments or inquiry when schools lack suitable equipment and consumable materials.
External science experiences add value. Fairs, industry visits and experts produced some of the largest shifts in practice and helped connect curriculum content to real-world science.

Early-career teachers need sustained and tailored support. Post-survey results showed lower confidence and less frequent practice among teachers with fewer than five years of experience.

Inclusive participation should be intentionally sustained. The strong representation of girls among science-fair presenters and participation of rural schools show the value of targeted outreach, but future monitoring should track whether access translates into sustained interest and progression.

Measurement design must be embedded from the start. Repeated motivation measures, direct student surveys and consistent participant identifiers are needed to assess targets reliably.

1. Institutionalize an integrated, year-round teacher-support model

Design science teacher development as a year-long process combining practical workshops, classroom implementation, structured mentoring, access to resources, peer exchange, and professional reflection. Certificates should recognize completed implementation, not attendance alone.

2. Establish a structured mentoring framework

Define mentor and mentee roles, a minimum number and suggested schedule of contacts, simple activity plans, expected outputs and periodic project-team follow-up. Match pairs by subject, grade level and practical needs; provide early support or re-matching when communication is weak. Recognize mentors through continuing professional development credits, certificates or other incentives.

3. Create a sustainable science-resource mechanism

Expand science sets, include curriculum-linked experiment cards and safety guidance, and budget for replacement of consumable materials. Prioritize schools with limited laboratories and equipment.

4. Develop regional science-learning ecosystems

Make science fairs, industry visits, research-centre visits and scientist-in-school activities recurring regional opportunities. Preserve the strong participation of girls, widen access for rural and under-resourced schools, and use partnerships among schools, municipalities, universities and companies to scale delivery.

5. Target support to early-career and inclusion-focused teachers

Offer additional classroom-management, differentiation and peer-observation support. Ensure activities can be adapted for different ages, abilities, languages and special educational needs.

6. Increase student ownership of inquiry

Move beyond demonstrations toward activities in which students formulate questions, select methods, collect evidence, interpret findings and communicate results.

7. Strengthen impact measurement

Repeat all target indicators in both survey waves; use consistent anonymous identifiers; apply survey skip logic; collect implementation counts; and introduce a short student attitude and career-awareness questionnaire.

8. Clarify logistics and responsibilities

Confirm transport, costs, group sizes, schedules and safety requirements in writing before fairs, visits and other off-site activities.

9. Conclusion: from project impact to system improvement

The **"Science and Me"** project demonstrates that teachers respond positively when professional development is practical, sustained and connected to real opportunities for classroom application. In 2025/2026, the project trained 42 teachers, created an estimated classroom reach of approximately 6,500 students, engaged more than 1,050 students through three regional fairs, distributed 19 science sets and connected more than 30 students with an advanced industrial environment. The results also show a consistent average improvement in confidence and classroom practice, high satisfaction and strong demand for continued participation.

The 2025/2026 project did not fully meet every numerical target as originally framed. The average confidence increase was 5.9%, below the proposed 10%, although the share of maximum-confidence responses rose by 13.8 percentage points. Motivation and student attitude targets cannot be fully quantified because the required repeated measures were not included. These limitations should be reported transparently. Across three cycles, however, the direction of travel is consistent: practical methods have become more regular, inquiry activities have deepened, and mentoring, science sets and external science experiences have become established elements of the model.

At the same time, the evidence supports a clear policy conclusion: the combined model - training, structured mentoring, resources, classroom implementation, science fairs and real-world science exposure - has greater potential than isolated activities. Mentorship is the connective element that helps transfer workshop learning into practice, supports early-career teachers when difficulties arise and keeps professional exchange active throughout the academic year.

Recommended policy direction

Move toward a national or regional school-support model in which practical science teaching is reinforced throughout the academic year by mentoring, resource access, inter-school collaboration and partnerships with science and industry. Scale should follow evidence and implementation quality, rather than replacing them.

Methodological note

The brief is based on self-reported teacher surveys. The baseline sample included 42 participating teachers and the post-intervention sample included 26 teachers. The comparison is unpaired and describes average group trends. The absence of a control group and direct student pre–post measures limits causal attribution. Results are best interpreted as credible evidence of project contribution and implementation influence.

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