Quality assurance and evaluation of the impact

LINKS

Learning
from
Innovation and Networking
in STEM

Coordinator

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Introduction

When considering the value of professional development, it is important to ensure that a process is in place which effectively evaluates the impact of this on teachers learning and on student outcomes. To consider the impact the professional development has had, it is essential to ensure that the design of the evaluation process provides accurate and meaningful feedback. It's not just the case that professional learning automatically impacts student outcomes; but instead, when teachers are taught to become reflective practitioners, by taking what they have learned, putting it into practice and then evaluating whether it is having the intended impact, that makes the difference. If the teacher is unable to effectively evaluate and reflect on their learning, then it may not have the intended impact on student outcomes.

For this section of the project, we have investigated the impact and evaluation processes which take place in each of the five contributing countries and drawn out those processes which would make for exemplary evaluation procedures. To do this, we met as a focus group where we shared good practices from the five contributing countries and identified those which were the most successful in each country.

RECOMMENDATIONS

We recommend the implementation of the following four strategies to ensure quality impact and evaluation of CPD.

1. Integrate CPD actions with research
2. Accreditation of CPD
3. External evaluation of CPD
4. Teachers as evaluators of CPD.

1

Integrate CPD actions with research

Integration of CPD with research allows us to develop pedagogical solutions and models through combining theory and practice.

In Finland, research is integrated into all CPD provided by the LUMA Centre Finland. CPD activities are designed to produce new pedagogical knowledge and solutions. The quality assurance of the CPD activities is also carried out through research. The research model widely applied by the LUMA Centre Finland is collaborative and inclusive design-based research that engages both pre- and in-service teachers (as mentioned in LINKS section 06). CPD activities are developed from the basis of research literature (theoretical problem analysis) and constantly evaluated and re-designed through research phases (empirical problem analysis). The design process is iterative and cyclic, which allows constant evaluation of the quality of each CPD activity.

In practice, in-service teachers participate in CPD workshops. After the workshops, they implement the new methods and experiment in their classrooms. New knowledge is converted into small-scale research projects and the impact of the training is recorded by the teachers themselves. The results are then considered together with the other participating teachers, from the perspective of previous research findings and theory. This way, teachers have a chance to get peer support and to reflect on the new activity. Testing new methods also teaches students about the nature of science and helps them to see teachers work as part of the scientific community. This model provides the LUMA Centre Finland with important and detailed data on the effects that the CPD activity has had both on the teachers and their students.

In Austria, the IMST project regards teachers as the crucial group contributing to the further development of learning and teaching. It is assumed that it is not possible to have a direct ‘‘transmission’’ of (general) knowledge from administrators, teacher educators and researchers to teachers; rather, the (specific) knowledge needs to be constructed by the teachers themselves (supported by colleagues, teacher educators, etc.). Therefore, the teacher is a key stakeholder in innovation and research. Policy regulations (e.g., educational standards) or research results play an important role in IMST, however, these top-down elements of educational steering need to be balanced with bottom-up based innovations by teachers. Thus, IMST regards teachers as experts who investigate their own teaching in a systematic and self-critical way (among others, writing “innovation reports” in the context of action research, see e.g., Altrichter et al., 2008)[1].

Benefits

- CPD providers are able to construct innovative programs based on current and ongoing research.
- Teachers build on previous research and develop action research within their own classrooms, mediating between top-down requirements and bottom-up needs of the teaching profession.

[1] Altrichter, H., Feldman, A., Posch, P., & Somekh, B. (2008). *Teachers investigate their work: An introduction to action research across the professions* (2nd ed.). London, UK: Routledge.

2

Provide accreditation of CPD

Accreditation is aimed at ensuring that the CPD provider will deliver an acceptable standard of CPD and the CPD experiences address the needs of the teachers and responds to objectives that are set at a National level (Ministry of education). Accreditation helps identify the quality providers.

Since 2016, in Italy, all CPD has been quality assured by the ministry. Standards for the quality and effectiveness of CPD activities ensure the quality of the whole training cycle. There are a set of indicators related to methodological, organisational, designing and financial aspects, which are organised as a question checklist (*See annex 2*).

All those involved in delivery of training (accredited CPD providers, schools, trainers, etc.) can use the checklist. After completion of CPD, teachers give feedback about the quality of the training: they need to answer the same question checklist in order to obtain the certificate of participation.

The accreditation of CPD courses are based on:

- organisation: duration, activity plan and timetable, location, targets, trainers and coordinator;
- educational aspects: content, objectives, method, expected achievements and final evaluation.

In addition, a continuous control of the CPD providers' quality is conducted: once the accreditation has been attained, it is important to maintain and prove they still meet the quality requirements over time under penalty of revocation of the accreditation.

In the UK, there are many CPD providers that work at a local and national level. STEM Learning have designed accreditation to ensure that all providers of CPD under the STEM learning banner are assessed and working at the appropriate level. There are a number of routes into this accreditation, all of which are assessed by educational leads at STEM Learning.

- Professionals wishing to work as CPD providers for STEM Learning can apply for the STEM CPD Quality Mark. They complete an application form which lists their qualifications and asks for examples of CPD led by the individual and a reference is taken.
- Another route to the accreditation is through the attendance on 6 day residential CPD. As part of completion of the CPD, the participants are required to deliver CPD in their local area or at a national level and this is evaluated against STEM Learning's guidelines.
- All employees within STEM Learning who provide face to face CPD are assessed delivering by a senior member of the education team on at least a yearly basis. All sessions are evaluated by participants.

Benefits

- It allows CPD providers to provide consistent, agreed quality, standards of CPD.
- Facilitators get to build experience and expertise.
- Teachers can develop the skills and confidence to act as expert CPD facilitators.
- An expanded pool of facilitators offering consistent quality support.
- Easier to find and develop specialist support.
- A way to show schools that you are part of a quality assured offer and that this offer forms part of an iterative process.

3

External evaluation of CPD

To ensure that evaluations are used to improve CPD programs, it is essential that there is oversight of the evaluation process. This ensures that processes are applied consistently to produce meaningful data and conclusions drawn can be used to allow for improvement.

In France, Fondation *La main à la pâte* relies on two forms of annual evaluations to ensure the quality of its CPD activities:

- an evaluation based on direct observations ensured by the scientific council of *La main à la pâte*;
- an external evaluation based on questionnaires.

The objective is to ensure that the actions respect quality criteria and comply with the strategy and objectives of *La main à la pâte*. In particular:

- that each session focuses on a scientific content;
- that participants are active and experience different forms of inquiry, questioning, reflection;
- that the session includes actions which allow transposition into the classroom.

The evaluation rests on questionnaires that are filled in directly by the teachers before, just after the CPD session and after a period of time.

The external examiner participates as an observer to a reduced number of sessions and establishes focus groups so as to collect comments and concrete examples from the teachers.

Evaluation measures teachers' gaining confidence in subject and pedagogical knowledge and how transferable the skills are.

Evaluations are shared among the *Maisons pour la science* (Houses for Science). These evaluations make it possible to evaluate whether CPD meets set objectives, is less biased and is easier for CPD providers to accept and value.

Since 2013, Fondation *La main à la pâte* has been putting in place a strategy of evaluation of impact.

The objective of the project was to evaluate the impact on students of Inquiry-based teaching methodology identifying improvements for CPD.

Teachers' understanding of the nature of science has been evaluated through questionnaires developed by a laboratory specializing in the didactics of science. The same laboratory has developed a grid for the observation of teachers' practice, aimed at the identification of explicit reference to inquiry and the scientific method.

The rigorous statistical approach has thus been coupled with videotaped observations in the classroom. Only a small subset of teachers (control and treatment) has been followed for the qualitative assessment.

Evaluated CPD activities consisted of sessions of 60 hours distributed over 2 years.

The methodology has consisted of a randomized controlled trial. Teachers of both the treatment and control group were volunteers and were randomized afterward. Control group teachers have received training sessions in the same domain and with the same objectives, delivered by the *Maisons pour la science*, but only for short sessions of 3-6 hours.

The results are still under analysis. Small positive effects appear at the level of the time spent on science teaching (for the teachers) and of content knowledge (for the pupils). No positive effects are yet visible on motivation, scientific reasoning, inquiry (for the students), nor on the understanding of the nature of science (for teachers).

In Italy, external evaluation of regional CPD in the seven national centres, gave feedback concerning the quality and relevance of the CPD model developed, dissemination and advisory actions taken by the project, the effectiveness with which the objectives of the project had been reached, the sustainability of the project and its CPD activities at national level. At the same time, key success and failure factors were identified and measures that will improve relevant, efficient, effective and sustainable project delivery in future partnerships were proposed.

In the UK, STEM Learning values feedback on taught sessions and uses it for planning future CPD and also for assessing competencies of teaching staff.

We gain feedback through verbal, written and online evaluations of every session delivered. After a CPD event, the course leader collects written feedback through the Learning and Evaluation tool (*See annex 4*) that participants complete during the taught sessions. These comments are collated and used to decide which sessions were most useful and which least useful. Participants can make notes on things of interest on these forms and where the feedback boxes are full, the deliverer is able to take ideas from what the participants found the most useful of all information shared. These forms are then used for written evaluation of the CPD which is monitored by line managers to check that the CPD is useful and relevant. This form is accompanied by the Impact toolkit which has an online evaluation section.

In the online form, the participants are asked for detail about the most effective elements of the CPD and how they would like to see it changed in the future. They are also asked for anything they would like covered in future CPD. This online evaluation alongside the written feedback and any verbal feedback the CPD deliverer has been given is then used for planning future CPD. After each course, the course leader looks at all available feedback and makes changes based on the participant feedback. If a session was particularly well received this might be extended and more examples in this style covered. If a session did not evaluate well, it will be changed or removed and replaced with something that participants have requested be covered. This feedback is shared within the teaching team and also with the entire STEM Learning network so that all CPD can be monitored for improvement.

Benefits

- There is consistency of application of the evaluation process;
- Feedback given can be used to aid improvement of the CPD experience.

4

Teachers as evaluators of CPD

We consider teachers' self-evaluation the most important aspect of teaching innovation and change, there is not teaching improvement without teachers' engagement in self-evaluation. The point is that only the teachers themselves can exactly know what are the strengths and the weaknesses of their practices, along with the real opportunities and risks of their own professional context. This teachers' involvement allows CPD providers to collect data for evaluating to what extent their training actions have really met teachers' needs in the most effective way. In order to encourage teachers to become reflective practitioners, it is necessary to involve them actively in the process of evaluation. Teachers should participate in the process of defining the objectives and of identifying the indicators that show the objectives have been reached.

In the UK, the development of teachers as reflective practitioners is integral to the development of courses. The process is guided by the use of a toolkit which leads teachers through the reflective process. This enables them to measure the impact that the change in practice from their learning has had upon their students. The toolkit has been developed using Guskey's five levels of evaluation.[2] When teachers first enroll on the course, they are asked to consider outcomes for the course.

After the first period of CPD, teachers write an action plan which details how they will put what they have learned into practice. They decide at this point which indicators they will use to measure the impact before they introduce the changes to their practice.

At the start of the next CPD period, they reflect on the impact the changes in practice they have made has had and look at where they can make further improvements. The toolkit guides teachers to further measure the impact after a longer period of time.

An issue with the use of the impact toolkit, is that it is completed outside of the training time and participants may not complete or complete it only superficially.

In Italy, teachers' self-evaluation engages them in reflecting on *what* they did in classroom, *why* and *how* they did it, and includes both reflection *in action* and *on action*. This involves them analysing their own teaching during their CPD course - while they are implementing with their students what they have learned (reflection *in action*) - and at the end of the CPD sessions and after the experimentation with the new method and materials in their classrooms (reflection *on action*). For example, a checklist for evaluating the implementation of the inquiry-based teaching through the self-analysis of classroom practices has been designed. It includes a list of criteria that indicates inquiry-based practices as supporting students' investigation, communication and group work, arranging the class and providing materials and equipment for the activities. (*See annex 3*)

Regarding the reflection *on action*, teachers are asked to complete a self-evaluation form at the end of their CPD course. Although different tools have been designed within the Regional Centres (e.g. questionnaires and the cognitive autobiography), all of them are focused on linking theory (*what teachers learned*) and practice (*what teachers do in class with their own learning*) and emphasize teachers change and development (*what teachers will do to improve their practices*).

Besides these specific means for self-evaluation, teachers are also asked to do **a final** report on their class activities to document the real and effective implementation of the new teaching approach and the content learned during the CPD course. When IBSE is the focus of the CPD, teachers are provided with a template to complete, which is introduced to them by the trainer at the beginning of the CPD course and then analysed in group before designing the learning activities. It asks teachers to describe all the steps of the learning path carried out in their class (on the basis of the 5e learning cycle model) including objects, resources, strengths and weaknesses, the impact on student skills and competences, along with students' misconceptions on the subject content addressed. These reports are presented by the teachers themselves during a final meeting at the end of the CPD course and then analyzed and discussed with peers and the trainer. The teachers' reports serve a double function: they give relevant elements - as directly coming from teachers - to evaluate the impact of their CPD actions, and provide teachers with objective data for their self-evaluation – as they have to recall the work done in their classroom.

In Austria, the IMST project, financed by the Ministry of Education, has been designed to promote teachers investigation into their own professional development. This project supports teachers' critical stance towards innovation and inquiry, which in turn is an important basis for disseminating inquiry-based learning.

Evaluations should take into account the current classroom situation in terms of teachers' skills and students' knowledge, attitude and competences. CPD actions aim at developing scientific knowledge and science didactics and skills in teachers and children; they also aim at fostering a positive attitude towards science, the understanding of the methods and practices of science (nature of science), the impact of science on society and citizenship. Education can have positive impacts on self-confidence and autonomy of reasoning. It is thus necessary to evaluate whether CPD actions fulfill these objectives in addition to being able to make teaching practices evolve.

The overall goal of IMST is to establish a culture of innovative MINDT teaching (Mathematics, Informatik/computer science, Natural sciences, Deutsch/German language, Technology). Culture of innovation means starting from teachers' strengths, understanding teachers and schools as owners of their innovations, and regarding innovations as continuous processes that lead to a further development of practice, as opposed to singular events that replace an ineffective practice. The establishment of a culture of innovation requires that activities gain impact at the individual level as well as at the local level as prerequisite for scaling up processes.

The IMST project has been developed at local, regional and national levels who cooperate through network activities. Teachers running small-scale projects in the regional networks might successfully submit a larger project in one of the thematic programmes; vice versa, experiences from such larger projects are presented in regional network meetings to encourage teachers to start small-scale projects. This helps the centres to build bridges to practice, to other academic institutions and fields, and to become stronger partners of IMST and the educational system. This increases the intended deep interconnection between policy, research and practice (*See annex 1 for supporting research*).

In Italy, the introduction of law 107/2015 has significantly modified the approach taken to teachers 'professional development. It states that teachers' professional development should be a compulsory structured program. The national teachers training plan containing guidelines for the process has been introduced.

The guidelines include the development of a teachers' portfolio, which has not yet been made mandatory, except for one section that is only requested to novice teachers. The teachers' portfolio should allow teachers to demonstrate the progress they have made in terms of skills and competencies through the professional development. The document enables them to engage in a reflection process on their own learning experiences and the connected level of professional growth and expertise they have been achieved over time.

Rather than a simple collection of certifications of PD activities, it has been conceived as a "process-tool" for documenting the evolution of teaching practices based on evidence. It should allow evaluation of the consistency between teachers' ideas and assumptions on teaching and learning – developed through their learning experiences - and their real classroom practices.

Through the partial or fully publication of the portfolio, teachers are able to show (and even share) the knowledge, skills and expertise they have developed over time.

Benefits of the portfolio are:

- the dynamic documentation of teachers' professional growth;
- their increasing awareness of the most effective teaching practices;
- a useful documentation of teaching innovation;
- the dissemination of good teaching practice;
- the opportunity to better connect students' achievements and teachers' skills.

Benefits

- By using a structured approach during their CPD, teachers are able to use this process to systematically make links from one experience to the next.
- Through the development of reflective practice, teachers are able to observe and evaluate the way they behave in the classroom.
- The use of the tool kit supports the development and maintenance of professional expertise.
- Teachers are stakeholders in their own professional development.
- They engage in peer- learning through liaison with CPD networks.

5

Summary for CPD providers

Why it is important to evaluate

Evaluations have no value in themselves unless they are used for improving future CPD actions. They can do this directly when feedback is used by the CPD provider in order to modify previous activities and plan new experiences with increasing impact. They can also do it indirectly when CPD actions or design-based research are validated by the evaluation and become “good practices” that can be largely shared.

Evaluation allows for the measurement of the impact of the change in practice with regard to teachers, their colleagues and outcomes for students.

Summary of the recommendations

THIS REPORT RECOMMENDS THAT:

- **All CPD is accredited to ensure quality of delivery and message.**
- **CPD providers respond to current research in their practices and involve teachers in action research within their own classrooms. This research is then incorporated into CPD programmes.**
- **Teachers are encouraged to actively reflect upon their own practice before and after training.**
- **CPD is evaluated by teachers as well as outside evaluators to ensure its quality.**

6

Annexes

Annex 1

1. Juntunen, M., & Aksela, M. (2013). *Life-cycle analysis and inquiry-based learning in chemistry teaching*. Science Education International, 24(2), 150-166. https://eric.ed.gov/?id=EJ1015764

2. Krainer, K. & Zehetmeier, S. (2013). *Inquiry-based learning for students, teachers, researchers, and representatives of educational administration and policy: reflections on a nation-wide initiative fostering educational innovations.* ZDM - The International Journal on Mathematics Education, 45(6), 875-886.

3. Link to Guskey's Five Levels of Evaluation of Professional Development: http://www.ascd.org/publications/educational-leadership/mar02/vol59/num06/Does-It-Make-a-Difference%C2%A2-Evaluating-Professional-Development.aspx

4. Report from the French national project: http://www.agence-nationale-recherche.fr/en/anr-funded-project/?tx_lwmsuivibilan_pi2%5BCODE%5D=ANR-13-APPR-0004

5. Altrichter, H., Feldman, A., Posch, P., & Somekh, B. (2008). *Teachers investigate their work: An introduction to action research across the professions* (2nd ed.). London, UK: Routledge.

6. Krainer, K., Zehetmeier, S., Hanfstingl, B., Rauch, F. & Tscheinig, T. (2018). *Insights into scaling up a nation-wide learning and teaching initiative on various levels. Educational Studies in Mathematics*.

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8. Cobb, P., & Smith, T. (2008). *The challenge of scale: Designing schools and districts as learning organizations for instructional improvement in mathematics*. In K. Krainer & T. Wood (Eds.), International handbook of mathematics teacher education (Vol. 3, pp. 231-254). Rotterdam: Sense Publishers.

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10. Krainer, K., & Peter-Koop, A. (2003). *The role of the principal in mathematics teacher development: Bridging the dichotomy between leadership and collaboration.* In A. Peter-Koop, A. Begg, C. Breen & V. Santos-Wagner (Eds.), *Collaboration in teacher education. Examples from the context of mathematics education* (pp. 169-190). Dordrecht, The Netherlands: Kluwer.

11. Krainer, K., Zehetmeier, S., Hanfstingl, B., Rauch, F. & Tscheinig, T. (2018). Insights into scaling up a nation-wide learning and teaching initiative on various levels. Educational Studies in Mathematics.

12. *Review of 10 years of impact from the National Science Learning Network*: https://www.stem.org.uk/sites/default/files/pages/downloads/STEM%20Impact%2010%20years%20report_Master_online.

13. *Evaluation of the impact of National Science Learning Centre CPD on Schools in the UK*: https://www.stem.org.uk/resources/elibrary/resource/44813/evaluation-impact-national-science-learning-network-cpd-schools#&gid=undefined&pid=2

Annex 2

Italy-Multilevel Quality Assurance of CPD activities.

Italy- CPD providers' quality standards.

CHECKLIST FOR THE QUALITY OF CPD	
PARTICIPANT INVOLVEMENT	
1. Did the teachers discuss the CPD proposal in their school?	
2. Before starting the CPD, has the teachers' reflection on the CPD content been fostered?	
3. Are the CPD activities consistent with the priorities of the School Evaluation Report? Do the CPD activities link to the participants' context?	
4. Before starting the CPD, have its main characteristics (objectives, activity plan, bibliography related to the content) been communicated?	
5. Has the initial competences level for the CPD attendance been communicated?	
6. Before starting the CPD, have the learning objectives been communicated?	
METHOD	
1. Does the training activity include workshop sessions, action / simulation research among teachers?	
2. Does the CPD provider engage teachers in implementing learning activities in their classrooms (not necessarily all of them)?	
3. Does the CPD provider promote the sharing of good practices and the interaction among participants? Does the CPD give examples of good-practices?	
4. Does the CPD provide for tutors, internal coordinators or any other actor to support teachers?	
5. Do the training activities allow a progressive development over time?	
6. Have the activity plan and timeline been respected?	
7. Is the CPD activity based on innovative methods which ensure collaboration among participants?	
8. Is there an online environment for studying and consulting additional resources?	
9. Are participants required to keep a learning journal in a digital format?	
IMPACT	
1. Are all the participants engaged in mapping their initial and final competences and evaluating the real acquisition of new ones?	
2. Does the CPD provider evaluate the impact of contents, methods, strategies on the teaching practices? Is it possible to evaluate if the CPD improved the main competences of the students?	
3. Is it set how short and medium term CPD impact will be evaluated?	
4.Does the training activity foresee to check the teachers' competences progression also through self-evaluation?	
5. Are there peer review activities within each module of the training path?	
TRANSFERABILITY AND DISSEMINATION	
1. Are the CPD contents, methodologies and activities transferable to other contexts?	
2. Does the CPD provider support the continuous teachers learning?	
3. Does the CPD provider engage all participants, or some of them, to disseminate the content and the activities among: a. school colleagues? b. teachers of the network? c. all interested teachers, through publication on appropriate web spaces or on institutional repositories?	
4. Have follow-up activities been planned asking participants to introduce in their schools what they have learned?	
5. Does the CPD include the collaborative production of transferable materials in the participants' schools? Are these materials shared having an open license?	
6. Is there a community of practice to ensure the peer exchange?	
7. Does the CPD provide a certification by third-party and independent organizations?	

Annex 3

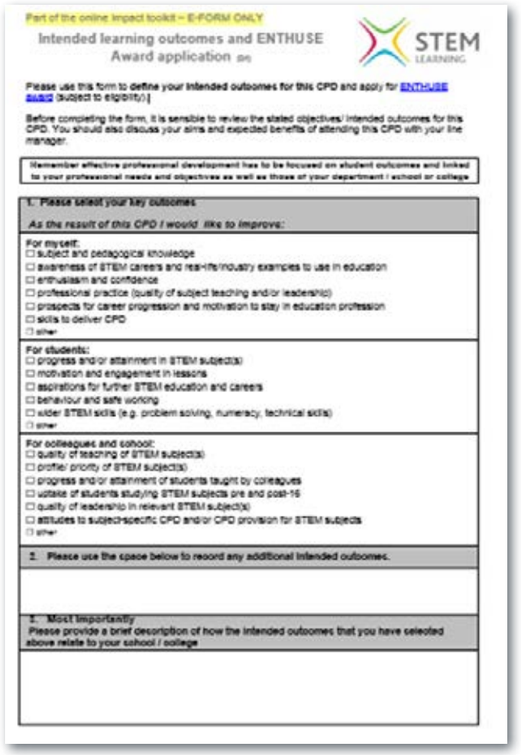
Italian questionnaire for the Observation of a lesson

OBSERVATION SHEET No. ..... BY THE TEACHER TUTOR	
ACTIONS	DESCRIPTION
What is the teacher doing?	
What the students are doing?	
What are the contents of the lesson?	
Which methods are the teacher implementing? (EDUCATIONAL STRATEGIES)	
What are tools ? (TOOLS)	
Are the students involved in the activities? (CONTEXT)	
What is the class management? (CLASS MANAGEMENT)	
Elements of quality observed	
Any problems encountered	
Resolution strategies eventually adopted	
NOTES	Requests for clarification Questions to ask General advice

Annex 4

STEM Learning Impact Toolkit forms

Form used pre course.



Part of the online impact toolkit – E-FORM ONLY

Intended learning outcomes and ENTHUSE Award application (pre)

STEM LEARNING

Please use this form to define your intended outcomes for this CPD and apply for ENTHUSE AWARD (subject to eligibility).

Before completing the form, it is sensible to review the stated objectives/ intended outcomes for this CPD. You should also discuss your aims and expected benefits of attending this CPD with your line manager.

Remember effective professional development has to be focused on student outcomes and linked to your professional needs and objectives as well as those of your department / school or college

1. Please select your key outcomes

As the result of this CPD I would like to improve:

For myself:
- ☐ subject and pedagogical knowledge
- ☐ awareness of STEM careers and real-life/industry examples to use in education
- ☐ enthusiasm and confidence
- ☐ professional practice (quality of subject teaching and/or leadership)
- ☐ prospects for career progression and motivation to stay in education profession
- ☐ skills to deliver CPD
- ☐ other

For students:
- ☐ progress and/or attainment in STEM subject(s)
- ☐ motivation and engagement in lessons
- ☐ aspirations for further STEM education and careers
- ☐ behaviour and safe working
- ☐ wider STEM skills (e.g. problem solving, numeracy, technical skills)
- ☐ other

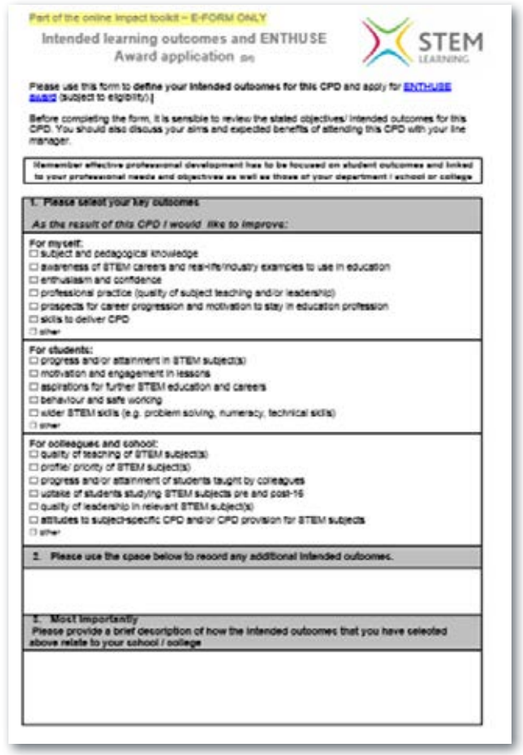
For colleagues and school:
- ☐ quality of teaching of STEM subject(s)
- ☐ profile/ priority of STEM subject(s)
- ☐ progress and/or attainment of students taught by colleagues
- ☐ uptake of students studying STEM subjects pre and post-16
- ☐ quality of leadership in relevant STEM subject(s)
- ☐ attitudes to subject-specific CPD and/or CPD provision for STEM subjects
- ☐ other

2. Please use the space below to record any additional intended outcomes.

3. Most importantly

Please provide a brief description of how the intended outcomes that you have selected above relate to your school / college

Form used during the CPD



Part of the online impact toolkit – E-FORM ONLY

Intended learning outcomes and ENTHUSE Award application (pre)

STEM LEARNING

Please use this form to define your intended outcomes for this CPD and apply for ENTHUSE AWARD (subject to eligibility).

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- ☐ professional practice (quality of subject teaching and/or leadership)
- ☐ prospects for career progression and motivation to stay in education profession
- ☐ skills to deliver CPD
- ☐ other

For students:
- ☐ progress and/or attainment in STEM subject(s)
- ☐ motivation and engagement in lessons
- ☐ aspirations for further STEM education and careers
- ☐ behaviour and safe working
- ☐ wider STEM skills (e.g. problem solving, numeracy, technical skills)
- ☐ other

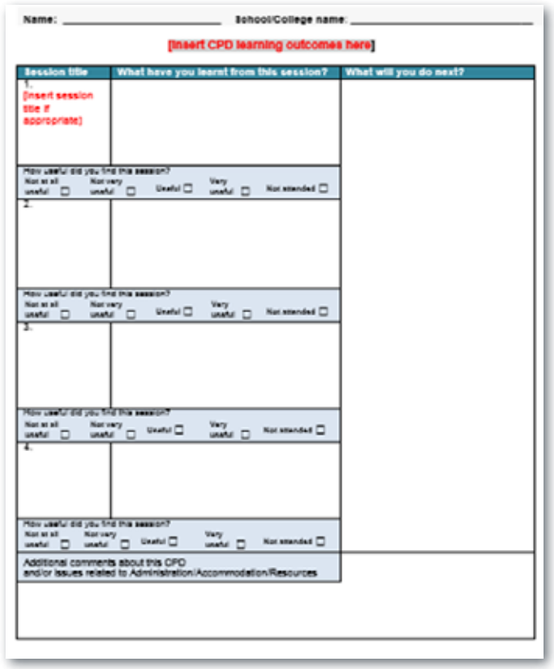
For colleagues and school:
- ☐ quality of teaching of STEM subject(s)
- ☐ profile/ priority of STEM subject(s)
- ☐ progress and/or attainment of students taught by colleagues
- ☐ uptake of students studying STEM subjects pre and post-16
- ☐ quality of leadership in relevant STEM subject(s)
- ☐ attitudes to subject-specific CPD and/or CPD provision for STEM subjects
- ☐ other

2. Please use the space below to record any additional intended outcomes.

3. Most importantly

Please provide a brief description of how the intended outcomes that you have selected above relate to your school / college

Form used post CPD as evaluation.

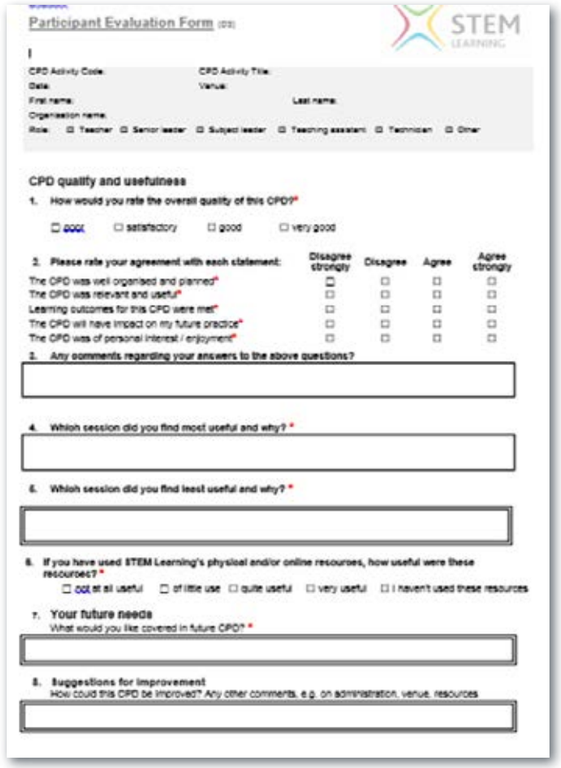


Name: _____ School/College name: _____

[Insert CPD learning outcomes here]

Session title	What have you learnt from this session?	What will you do next?
1. [Insert session title if appropriate]		
How useful did you find this session? Not at all useful ☐ Not very useful ☐ Useful ☐ Very useful ☐ Not attended ☐		
2.		
How useful did you find this session? Not at all useful ☐ Not very useful ☐ Useful ☐ Very useful ☐ Not attended ☐		
3.		
How useful did you find this session? Not at all useful ☐ Not very useful ☐ Useful ☐ Very useful ☐ Not attended ☐		
4.		
How useful did you find this session? Not at all useful ☐ Not very useful ☐ Useful ☐ Very useful ☐ Not attended ☐		
Additional comments about this CPD and/or issues related to Administration/Accommodation/Resources		

Form used for teacher to action plan their interventions. Completed post CPD with senior manager in school.



Participant Evaluation Form (ES)

STEM LEARNING

CPD Activity Code: CPD Activity Title:
Date: Venue:
First name: Last name:
Organisation name:
Role: ☐ Teacher ☐ Senior leader ☐ Subject leader ☐ Teaching assistant ☐ Technician ☐ Other

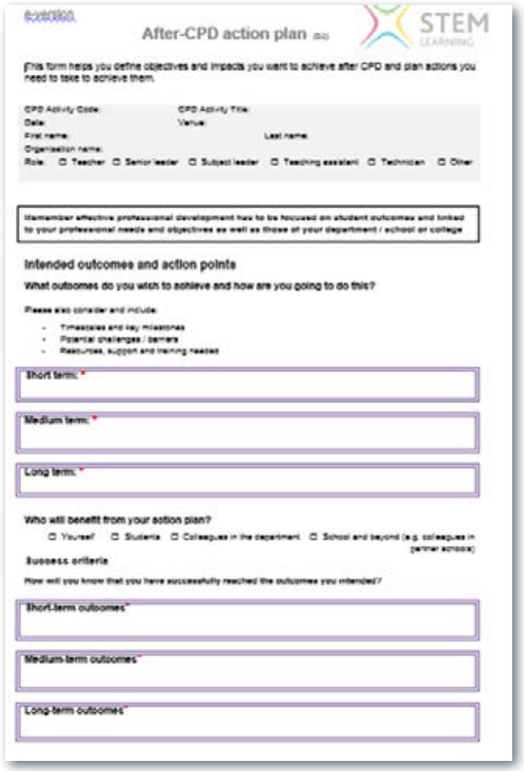
CPD quality and usefulness

1. How would you rate the overall quality of this CPD?*
   ☐ poor ☐ satisfactory ☐ good ☐ very good

2. Please rate your agreement with each statement:

	Disagree strongly	Disagree	Agree	Agree strongly
The CPD was well organised and planned*	☐	☐	☐	☐
The CPD was relevant and useful*	☐	☐	☐	☐
Learning outcomes for this CPD were met*	☐	☐	☐	☐
The CPD will have impact on my future practice*	☐	☐	☐	☐
The CPD was of personal interest / enjoyment*	☐	☐	☐	☐

3. Any comments regarding your answers to the above questions?
4. Which session did you find most useful and why? *
5. Which session did you find least useful and why? *
6. If you have used STEM Learning's physical and/or online resources, how useful were these resources? *
   ☐ not at all useful ☐ of little use ☐ quite useful ☐ very useful ☐ I haven't used these resources
7. **Your future needs**
   What would you like covered in future CPD? *
8. **Suggestions for improvement**
   How could this CPD be improved? Any other comments, e.g. on administration, venue, resources



After-CPD action plan (ES)

STEM LEARNING

This form helps you define objectives and impacts you want to achieve after CPD and plan actions you need to take to achieve them.

CPD Activity Code: CPD Activity Title:
Date: Venue:
First name: Last name:
Organisation name:
Role: ☐ Teacher ☐ Senior leader ☐ Subject leader ☐ Teaching assistant ☐ Technician ☐ Other

Remember effective professional development has to be focused on student outcomes and linked to your professional needs and objectives as well as those of your department / school or college

Intended outcomes and action points

What outcomes do you wish to achieve and how are you going to do this?

Please also consider and include:
- Timescales and key milestones
- Potential challenges / barriers
- Resources, support and training needed

Short term: *

Medium term: *

Long term: *

Who will benefit from your action plan?
☐ Yourself ☐ Students ☐ Colleagues in the department ☐ School and beyond (e.g. colleagues in partner schools)

Success criteria

How will you know that you have successfully reached the outcomes you intended?

Short-term outcomes*

Medium-term outcomes*

Long-term outcomes*

After-CPD action plan (ES)

STEM LEARNING

Impact and evidence planner

1. Please select areas, which you expect to benefit from your post-CPD actions:

Yourself: *
☐ subject and pedagogical knowledge
☐ awareness of STEM careers and real-life/industry examples to use in education
☐ enthusiasm and confidence
☐ professional practice (quality of subject teaching and/or leadership)
☐ prospects for career progression and motivation to stay in education profession
☐ skills to deliver CPD
☐ other (please explain in the open response section below)

Students: *
☐ progress and/or attainment in STEM subject(s)
☐ motivation and engagement in lessons
☐ aspirations for further STEM education and careers
☐ behaviour and safe working
☐ wider STEM skills (e.g. problem-solving, numeracy, technical skills)
☐ other (please explain in the open response section below)

Colleagues and school: *
☐ quality of teaching of STEM subject(s)
☐ profile/ priority of STEM subject(s)
☐ progress and/or attainment of students taught by colleagues
☐ uptake of students studying STEM subjects pre and post-16
☐ quality of leadership in relevant STEM subject(s)
☐ attitudes to subject-specific CPD and/or CPD provision for STEM subjects
☐ other (please explain in the open response section below)

2. Please use the space below to record any other impacts you expect to achieve

3. Evidence
What evidence you'll need to collect before, during and after the implementation of your action plan to verify the impact

☐ Student progress/ attainment data
☐ Student feedback (eg Student Voice, interviews)
☐ Samples of student work
☐ Uptake of STEM subject(s) pre and post-16
☐ Feedback from external observation of lessons (eg by a colleague, subject leader, Ofsted)
☐ Feedback from colleagues
☐ Changes to schemes of work/ lesson plans/ assessment methods/ resources
☐ Videos/ posters/ photos
☐ School/ department developmental plans/ documents
☐ Your perceptions/ reflections/ reflective journal
☐ Other (specify)

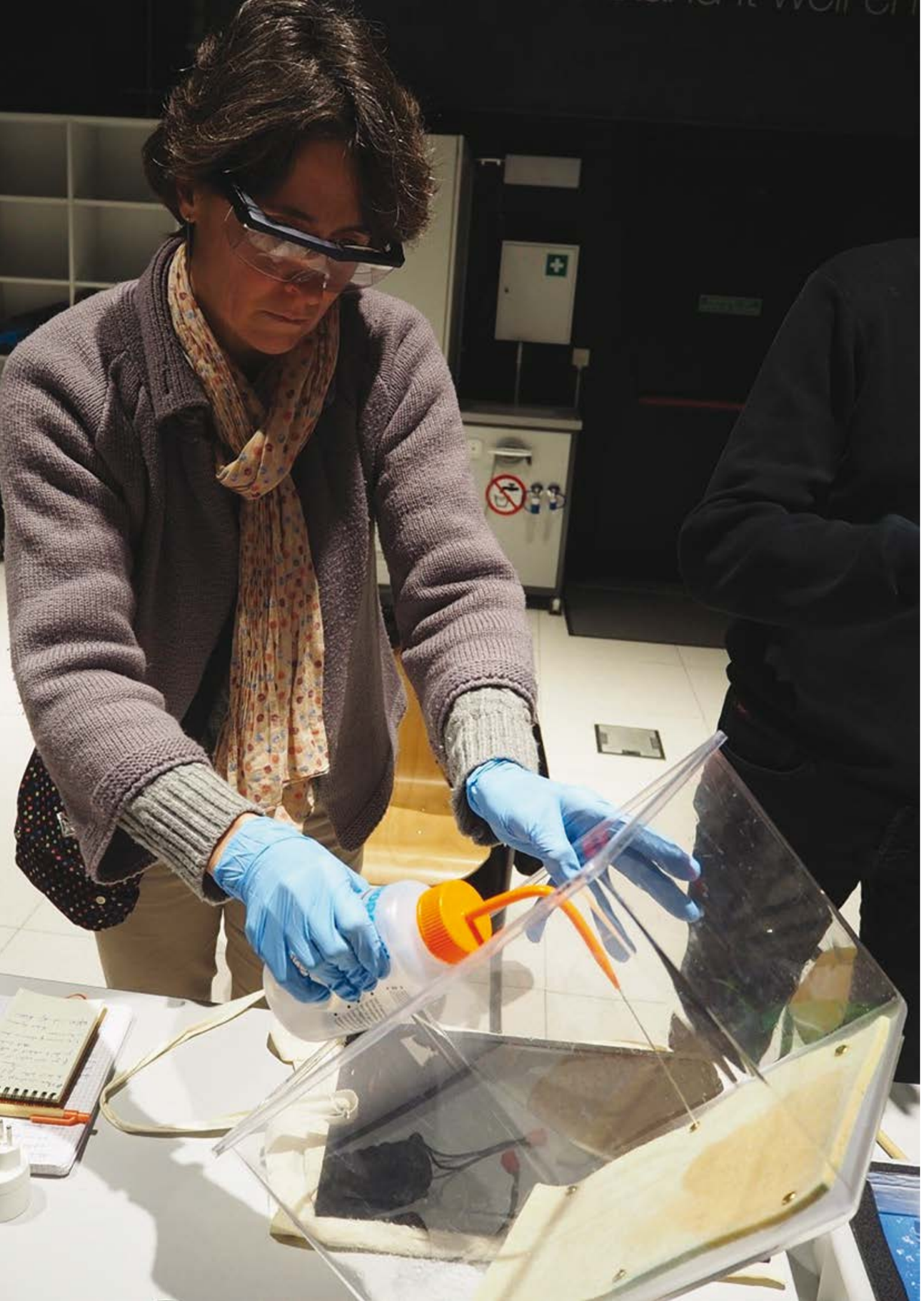
Rolls-Royce Science Prize competition

☐ Would you like to be entered into the Rolls-Royce Science Prize competition? (open to all STEM subjects)

Senior leader /Line manager details

☐ I have discussed this action plan with my line manager or senior leader

Name _____ Email _____



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LINKS

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STEM LEARNING

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Maison pour la science en MIDI PYRÉNÉES
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