

# Developing and evaluating a coaching model for teachers professional development in physics

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**Abstract.** This session explores a coaching model for teacher professional development that was employed in a research and development project at Oxford University. The author worked with three teachers of A-level physics classes (age 16-18). The coaching model was made of four main stages – 1) coach's model lesson observed by teacher; 2) co-planned and team taught lesson; 3) coach observation of teacher's lesson; 4) teacher sharing their learning journey with colleagues at regional meetings. The findings, benefits and challenges of this programme will be presented and discussed.

## 1 The rationale for developing a coaching model

The Stimulating Physics Network (SPN) is a government funded programme developed and managed by The Institute of Physics. The programme aims at supporting schools where the teaching and learning of physics are limited by the lack of specialist teachers of physics. The programme is meant to be bespoke and a discussion with the Head of Science at participating schools is held to agree on the support a Teaching and Learning Coach should offer.

As a coach I am often asked to model lessons and support the teaching and learning of A-level physics. However, this area of the curriculum can often generate lower numbers of teachers' continuous professional development (CPD) hours than preferable according to the key performance indicators (KPI) set by the programme objectives. This is due to the lower number of teachers involved in A-level physics education.

I believe it is important that the programme remains as bespoke as possible and I want to continue to support A-level teaching and learning in the schools I work with, but a need to develop a coaching model that remains bespoke, but that has the potential to grow in reach, has shaped the development of this project.

The model I developed draws its characteristics from a range of features common to effective continuous professional development and learning (CPDL) programmes (1)(2)(3). These features can be summarized as:

- Modelling best practice through active learning: this is highly effective when teachers participate in learning activities that they can later use with their students, because they have an opportunity to discuss their learners' alternative conceptions. It is also effective when teachers observe a coach/mentor teach a model lesson with their students, as they can see how effective learning and teaching strategies through their own (or non-specialist) subject can be implemented
- Content focused: the above is usually more effective when teachers experience new techniques and learning activities through subject specific content focus, as this helps them articulate and visualise better how to transfer these skills
- Using misconceptions to generate discussion and debate in the classroom: I have experienced high impact and learners' progress when students (and teachers) are presented with alternative conceptions, or discuss their own misconceptions, before giving a more suitable explanation/model. This is very much in line with the fascinating work of Muller et Al. (4).
- Opportunities for feedback and reflective practice: this is key to internalising new strategies and learning. Having an opportunity to discuss a lesson and reflect (ideally with a coach) on each other's practice can generate rich professional dialogue. These reflections are an important component of Clarke and Hollingsworth's (5) model for teachers' professional growth, as a salient outcome can be reflected upon and encourage a teacher to go further through

professional experimentation in their classroom. This experimentation with learners can often lead to further and more evident salient outcomes, as it is much more convincing for a teacher to observe progress in their learners, rather than simply experiencing what seems to be a good idea during a professional development course. The impact on learners from these salient outcomes will contribute to embed these new practices in the teacher's personal domain through a change in beliefs and practice.

## 2 The coaching model

My coaching model is composed of four main phases:

1. Modelling a lesson where the teacher observes the coach teach their class with a focus identified by the teacher based on their individual CPD needs and interests. The model lesson is followed by a reflection and feedback session, where the knowledge quartet (KQ) (6) is used to reflect on the outcomes of the lesson. This also models how the coach reflects on their own lesson and the strategies they employ to facilitate learners' progress
2. The following lesson is team planned and team taught by the coach and teacher. A lesson observation is jointly completed and a discussion of the outcomes of the lesson is carried out in the post-lesson reflection session
3. The coach observes the teacher who has planned a new lesson independently. Observation notes are then discussed in a feedback and reflection session. Typically, the coach will ask questions they might have written during the lesson observation to help clarify some of the choices made by the teacher. This is done in a non-judgemental way and the nature of the questions are meant to help the teacher to reflect on their practice and focus on students' outcomes
4. The teachers who were coached through this model share their learning journey with other colleagues in their department and/or at regional workshops funded by the SPN

The coaching model described above is an attempt to develop CPDL programmes that are highly bespoke, but that at the same time have the potential to develop larger groups of teachers through sharing of good practice. A key learning point for the teachers coached through this model is phase 4, where they have to articulate what specific elements of the programme supported their progress as educators. My prediction is that this particular process will engage them in deeper reflective practice and generate powerful salient outcomes, which will lead to further professional experimentation, which in turn will have a higher potential to become embedded in the teachers' personal domain (5).

## References

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