Designing Professional Development Handouts

Contents

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Handout 1: Aspects of practice that could be a focus for PD

Organize the statements into two sets, according to whether you think that they are important or not a priority for PD right now.

Select two topics of highest priority, and be prepared to justify why these are highest priority to the whole group.

How to lead whole-class discussions.	Eliciting and interpreting students' reasoning.
Understanding and using formative assessment.	Learning how to teach a difficult concept.
Assessing student progress.	Building respectful relationships with students.
Specifying and reinforcing productive student behavior.	Asking questions that promote students' reasoning
Setting up and managing collaborative discussions.	Using students' cultural, and personal backgrounds as resources for instruction.

Adapting lessons to students' individual learning needs.	Developing norms and routines for classroom discourse and work.
Setting long- and short-term learning goals for students.	Designing single lessons and sequences of lessons.
Learning how to teach mathematical modeling.	Designing effective mathematical tasks for students
Learning about the progression of a topic in a commonly used textbook.	Working with parents.
Current changes in the curriculum.	Understanding how math is used in the world around us.

Handout 2: Where are teachers starting from?

Mathematics is best learned through practice.	Mathematics is best learned through discussion.
Learners learn mathematics best when they work on their own.	Learners learn mathematics best when they work collaboratively.
Mathematics is a network of ideas.	Mathematics is a hierarchical subject.
It is best to begin teaching mathematics with easy problems, working gradually up to harder ones, otherwise learners make mistakes and lose confidence.	It is best to begin teaching mathematics with complex problems, or learners won't appreciate why mathematics is necessary.

Mathematics is a creative subject. Learners learn best by creating their own questions and methods.	Learners learn mathematics best by working through carefully constructed exercises.
It is better to spend time on fewer questions and solve them in more than one way, even if this slows the session down.	I always feel in a hurry when I teach mathematics. There is so much to cover in the time.
Learners are at such different levels of competence that I have to allow each one to work at their own pace.	I try to teach the whole group at once and keep them at the same pace.
I find out which parts of mathematics learners already understand and don't teach those parts.	I start teaching mathematics from the beginning, assuming they know nothing.
I try to avoid learners making mistakes when learning mathematics.	I encourage my learners to make and discuss mistakes when learning mathematics.

Handout 3: Sample professional development workshops

This outline consists of a series of meetings using the Mathematics Assessment Project PD modules from the website http://map.mathshell.org/pd

Meeting 1: Formative Assessment	*Key question:*	**How can I respond to students in ways that improve their learning?**
	Activities:	• Introducing formative assessment • Teachers' own experiences of formative assessment • Principles for formative assessment • Analyze students' responses to problem-solving tasks • Observe formative assessment in action • Plan a formative assessment lesson together • Consider the effects of feedback on student learning
	Challenge	Use one of the lesson plans and report back on what happens next time.
Meeting 2: Concept Development	*Key question:*	**How can I help students develop a deeper understanding of Mathematics?**
	Activities:	1. Reporting back on the lessons taught 2. Using assessment tasks 3. What causes mistakes and misconceptions? 4. The Formative Assessment Lesson 5. Working on four different task types: Classifying mathematical objects; Interpreting multiple representations; Evaluating mathematical statements; Exploring the structure of situations 6. Plan a lesson together
	Challenge	Teach the lesson you have planned and report back next time on the outcomes
Meeting 3: Problem Solving	*Key question:*	**Do I stand back and watch, or intervene and tell them what to do?**
	Activities:	1. Reporting back on the lessons taught 2. Revising structured problems 3. Compare structured and unstructured problems 4. Consider strategies for offering help 5. Observe and analyze a lesson (video) 6. Plan a lesson together
	Challenge	Teach the lesson you have planned and report back next time on the outcomes
Meeting 4: Improving learning through questioning	*Key question:*	**How can we ask questions that improve thinking and reasoning?**
	Activities:	1. Reporting back on the lessons taught 2. Reflect on the questions we ask 3. What types of questions develop thinking and reasoning? 4. Observe and analyze a lesson (video) 5. Plan a lesson together 6. Solve a problem, "thinking aloud"
	Challenge	Teach the lesson you have planned and report back next time on the outcomes
Meeting 5 Students working collaboratively	*Key question:*	**How can students learn from discussing mathematics?**
	Activities:	1. Reporting back on the lessons taught 2. Experiencing a discussion (in groups) 3. Analyzing a discussion (role play from transcripts) 4. Recognizing the concerns of teachers 5. Creating & Establishing "Ground Rules" with students 6. Managing collaborative discussion 7. Observe and analyze a discussion lesson (video) 8. Plan a lesson together
	Challenge	Teach the lesson you have planned and report back next time on the outcomes
Meeting 6 Reflecting on our learning	*Key questions:*	**What have we learned? How can we share this with colleagues?**
	Activities	1. Reporting back on the lessons taught 2. Sharing what participants have learned 3. Embedding our learning in our future practice 4. Planning to share our learning with colleagues
	Challenge	Use the materials we have shared with you to run a session with your colleagues back at school.

Handout 4: Helping teachers to report back on experiences

This prompt sheet has been used to help interview teachers as part of their reporting back.

What were your fears and expectations about the lesson?

How did you prepare for the lesson?

- Did you assess students before the lesson?
- How did students' prior knowledge affect your planning?

How did you organize the lesson?

- Did you use your preliminary assessment to inform your organization?
- Did you change the seating, for example?

How did you introduce the lesson?

- Did you share your learning intentions and criteria for success?
- Did you provide feedback on any preliminary assessment?
  What for did this take? Questions? Advice? Scores?
- What did you tell the students about:
  The way they should work on the activity?
  The reasons why you wanted them to work in this way?

What happened during small group work?

- What did students find difficult to understand?
- What did you find difficult?
- How and when did you intervene?
- What were the best questions you asked?
- Were students helping one another?
- Was there any evidence of peer assessment?

What happened during whole class discussions?

- How did you organize it? Just at the end, or during the lesson?
- How did you select student work to discuss?
- Were students able to discuss the reasoning of others?
- What did you draw attention to?

What did you learn from this experience?

- What would you do differently next time?
- Have your experiences affected your attitudes towards teaching and learning?
- Do you feel you are changing in your attitudes towards assessment, student errors, classroom talk?

What general issues have arisen for you?

- What general issues do you wish to raise with the whole group?

Handout 5: Reflecting on the models

Which of the **characteristics of effective PD** listed below does each of these models incorporate? Complete the table, identifying the strengths and weaknesses of each model.

- **Experiential** – stimulating and drawing on teachers' own experiences as reflective practitioners.
- **Sustained** – involving cycles of planning, predicting, enacting, and reflecting.
- **Collaborative –** involving networks of teachers and administrators.
- **Informed –** by outside expertise and research.
- **Focused –** attentive to the development of the mathematics itself.

(Guskey, 2002; Joubert and Sutherland, 2009; Villegas-Reimers, 2003; and many others…)

	Effective PD characteristics	Strengths	Weaknesses
Training Transmission of information by an expert.			
Coaching Coach and teacher working together one on one.			

	Effective PD characteristics	Strengths	Weaknesses
Workshop course Courses mediated by a provider, that offer teachers opportunities to explore ideas in their own classrooms and report back.			
Professional learning communities Teachers take over responsibility for setting their own research goals and collaboratively and systematically study them in their own classrooms.			

How might these models be combined and organized in your schools?

What immediate questions does this raise for you?