

TITLE OF PROJECT - Working Together in Numeracy

Schools' background

The project was undertaken by the Head Teacher and P6 and P7 class teachers of South Lodge Primary in Invergordon and the Principal Teacher and another two members of the Invergordon Academy Mathematics department. Both schools had identified problem solving and enquiry and Assessment is for Learning as areas for further development in their respective improvement plans and therefore decided upon these aspects as the main focus for development within the project. The Quality Improvement Officer (QIO) Numeracy supported the project.

Aims of the project

The project aimed to

- build on the good practice in learning and teaching in the two participating schools;
- improve the quality and continuity of teaching and learning in mathematics across the primary and secondary sectors, particularly in problem solving and enquiry;
- improve teaching and learning in maths from Primary 6 to Secondary 2 through effective implementation of formative assessment and cooperative learning strategies;
- improve attainment in maths in P6-S2 [long term aim] by giving pupils greater confidence to solve problems;
- improve transition arrangements from primary to secondary; and
- establish a greater knowledge of colleagues' working practices [cross-sector].

The process

The project began with an initial staff and pupil evaluation of practice in learning and teaching in problem solving and enquiry within both schools. Staff from South Lodge and Invergordon Academy then visited models of good practice within the local area to observe quality teaching and learning in problem solving and enquiry. They then met on several occasions in twilight sessions to discuss the methodologies and resources used to teach problem solving and enquiry in these models as well as within their own establishments. They then decided on the main foci for development within the project.

Staff then worked as a cross-sector team to deliver baseline assessment materials to all pupils in primaries 6 and 7 and S1 and 2. Separate sessions ran in primary and secondary with staff from both schools involved in delivery of the core assessment. This highlighted strengths as well as areas for development in pupils' ability to solve problems in a range of strategies. As a result, staff decided to focus initially on developing staff and pupil confidence and competence in teaching and learning in two strategies:

- 'Guess and Check'; and
- 'Logic'.

Visits were then undertaken by staff to both schools. During each visit the host teacher planned and then delivered a lesson focusing on developing pupils' competency in using the targeted strategies and a visiting teacher [from the other sector] supported the pupils in their learning. As the project developed and teachers became more confident in working in each others' classrooms, staff then began to plan lessons jointly and then implemented these plans in team-teaching sessions. They also undertook joint informal evaluations of lessons. Staff were given quality time to research and then identify a range of online and paper based resources which could be used to motivate and inspire pupils during problem solving sessions.

Both schools ensured parents were kept informed of their child's involvement in the project through the inclusion of occasional updates within their school's newsletter. Staff from other stages and departments in both schools were informed of the

project's progress through discussion at staff meetings and inclusion of project news within departmental minutes. The authority's secondary maths co-ordinator was also kept informed of the project's progress in order that information could be shared with other secondary maths departments in Highland. Staff involved in the project were encouraged to communicate with each other through an online BLOG which also posted minutes of meetings as well as key issues to promote professional discussion.

Impact of the project

The project has encapsulated the visions, values and principles of a Curriculum for Excellence and has addressed the need to ensure that pupils are enabled to become successful learners, confident individuals, respectful citizens and effective contributors.

Pupils have very much enjoyed their participation in the numeracy project. They have developed a greater confidence in tackling problems and exhibit a greater willingness to 'have a go'. They have particularly benefited from increased opportunities to participate in collaborative learning, this being a key focus within the planning and delivery of each lesson. They have very much enjoyed and appreciated the opportunity to work with other staff. In particular, primary pupils benefited from the opportunity to meet and work with secondary staff prior to transition. They also found the experience of working with male staff to be both novel and beneficial. Pupils in the secondary sector enjoyed the opportunity to meet former staff from primary and responded by giving maximum effort to producing their best work. It is yet too early to measure whether pupil participation in the project has impacted significantly on their attainment in maths.

The project has impacted very positively on all participating staff. It reinforced and developed the good practice which already existed within both sectors. Staff have appreciated quality time being given to discuss teaching approaches, to observe practice and to participate in team-teaching sessions with practitioners from within and outwith their own sectors. They now have a much greater appreciation of practice in both the primary and secondary sectors and there is now a greater

commonality of approach e.g. all staff are now using the same terminology to introduce and reinforce problem solving strategies. There is now a more focused approach to the inclusion of problem solving and enquiry within planned teaching sessions in maths. Staff have developed a greater confidence in the teaching of problem solving and demonstrate improved techniques. They have a greater awareness of the wealth of resources available to support delivery of PSE and implement these resources more effectively within planned lessons. Much greater account is now being taken of the need to ensure that appropriate real-life contexts are used to develop pupils' learning in maths.

Next steps

The project will continue to be implemented until the end of session. A slightly smaller scale transition project, designed to impact on all schools within the associated school group, is also planned for next session.

Staff within the current project will continue to meet to plan and then implement further team-teaching sessions. These will focus on the implementation of agreed formative assessment strategies including the use of collaborative learning techniques as well as pupil self and peer assessment. Staff will agree on a common structure for each maths lesson i.e. appropriate introduction, middle and plenary sessions. There will be a written agreement on what will be taught and how it will be taught and this will be distributed to and discussed with all schools in the associated school group as well as to other staff within the maths department of Invergordon Academy. After each team-teaching session, staff will participate in a group evaluation of practice using video footage and other evidence including samples of pupils' work. This will allow all participants to experience the range of lessons delivered.

An end of project assessment will be undertaken with pupils to measure gains in achievement. Pupils and staff will also complete an evaluation of their participation in the project through use of a simple questionnaire [staff] as well as an electronic voting system [pupils].

A Maths Jamboree is planned to take place during the Primary Induction week in June. This will involve all four primary schools within the Invergordon ASG as well as several S1 and S2 classes in working collaboratively to solve a range of problems. An open invite will be extended to all P7 parents to participate in this event. A case study of the project will be on show throughout the Maths Jamboree.

A case study of the project will also be posted on the authority's Curriculum for Excellence website as a means of sharing good practice with other schools in Highland. Staff participants will also share practice with other practitioners at a Learning and Teaching Scotland event in May.