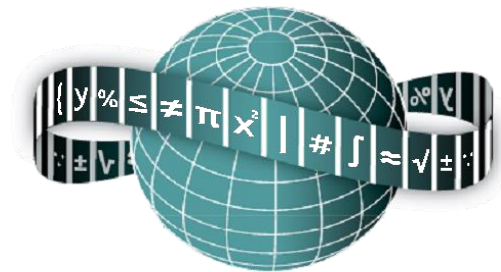


Maths Counts

Insights into Lesson Study

Learning and Teaching Mathematics in
Irish Post-Primary schools



Introducing Lesson Study to Irish Post-Primary Schools

Purpose:

- Investigate and review how practices of Lesson Study fared when introduced as part of a pilot project
- Examine the challenges involved and complexities encountered in introducing Lesson Study to post-primary schools
- Concerns that had to be addressed in introducing Lesson Study in the midst of establishing a new Syllabus and reformed examination structure
- Consider the reforms and challenges in light of relevant research
- Focus on Conference Presentations: Insights into Lesson Study - Taking root in more fertile ground.

- 250 mathematics teachers – Junior & Senior Cycle
- 24 post-primary schools
- Reflective of range of post-primary schools

What is Project Maths?

Inaugurated by the NCCA in 2008 in 24 schools and introduced nationally in 2010:

- Change what students learn in mathematics: New Syllabus (NCCA)
- Change how students learn mathematics: (Project Maths Development Team)
- Change how it will be assessed to reflect different emphasis on understanding and skills: State Examinations Commission.

Continuing Professional Development Programme for Project Schools

- September 2008: National Coordinator & 6 Regional Development Officers appointed
- 4 Year Professional Development Programme established with 24 schools
- Series of 10 workshops
- On-going support between workshops: school visits, extensive email and phone support, elective Summer courses (NCE-MSTL), Content Courses, ICT Courses.

Research on CPD

Aware of :

- inadequate one-shot “delivery” model
- positive features of workshops.

My Interest in Lesson Study:

- Interest in Japanese Lesson Study as a form of teacher professional development: (Curcio, 2005; Fernandez & Yoshida, 2004; Chokshi et al., 2004; Lewis et al., 2004; Watanabe, 2003; Fernandez, 2002; Lewis, 2002, Stigler et al., 1999; Lewis et al., 1998).
- Effective way of implementing real change in classroom practice.

Lesson Study

- To achieve aims of Project Maths: Change in professional practices and attitudes necessary
- Characteristics of Lesson Study: Teacher-led professional development that takes place in the classroom, students at the heart of the activity – pertinent in the Project Maths context.

Lesson Study

Aware:

- Lesson Study - a stranger amid professional cultures of teaching in Ireland
- of “quick-fix” trap – approach transplanted from one country to another (Le Metais, 2003)
- Japanese high performance in maths in international comparisons based not only on high quality Lesson Study but other cultural, social, religious and family factors (Conway & Sloane 2005, Kelly & Sloane 2003, Lewis 2002, Stevenson & Stigler 1992).

Continuing Professional Development Programme:

- Teachers actively participated in new methodologies at workshops
- Exchange of ideas at workshops among schools
- Continuity between workshops
- Engaged in Lesson Study between workshops supported by RDO
- Purposeful collaboration within schools
- Workshop 3, end of Year 1 participants involved in sharing with colleagues from other schools within cluster groups on how they got on with Lesson Study.

Six main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

1. Traditional practices of teaching & learning (Lyons et al. 2003; Brosnan 2008):

Teaching & Learning Plans:

- Stimulate new ways of doing things
- Focus on key content & pedagogical knowledge
- A complement to more traditional methodologies
- RDO to support teachers in designing a detailed Lesson Plan for Lesson Study.

Main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

2. Beliefs & classroom practices (OECD 1991, Lyons et al. 2003, Smyth et al. 2007, TALIS 2009):

- Agree with constructivist approaches but low reported usage.
- Possible for teachers to assimilate new strategies into traditional teaching without a concomitant change in fundamental beliefs about the nature of classroom activities (Brosnan, 2008).
- Mismatch: Teaching & Learning Plans offered potential to tackle this.

Main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

3. The question of time to conduct Lesson Study on an ongoing basis:

- Substitution...dedicated time provided
- Helped project team's efforts to embed Lesson Study practices into the cultures of teachers.

Main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

4. Peer observation: Collaborative practices not a feature of CPD:

- Use videos
- Collect students' work
- Lesson studied later without leaving classroom
- Added dimension to Lesson Study: provide teachers with the opportunity to listen to learners' misconceptions and misunderstandings.

Main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

5. Insulation & Isolation from professional colleagues:

(OECD, 2009; Hogan et al. 2007)

- Anxious about publicly teaching lessons for their peers
- Crucial point, Lesson Study shifts the focus from evaluating the performance of the teacher to the “how” and the effects of teaching
- Ownership of lesson diffused across the group who planned the lesson.

Main challenges anticipated before introduction of Lesson Study and measures taken to respond to them

6: Will it improve students' performance in examinations?

- No formal proof (in Ireland) that Lesson Study would improve students' performance in the State examinations.
- Advised teachers that data collected could provide a rich picture of students' understanding.
- Such rich documentation could also be used to show others how Lesson Study is being used to improve student understanding.

Four further complexities during the course of the Project's initial work (2008-2009)

1. For many teachers the cultural shift from their insulation & isolation proved a step too far too quickly.
2. Many teachers felt participation in Lesson Study was an add-on to their workloads.
3. Producing a detailed Lesson Plan collaboratively was about producing a product for the system as distinct from a process that would improve their students' understanding.

Further complexities during the course of the Project's initial work (2008-2009)

- Idea not dismissed entirely
 - 13 Schools produced detailed Lesson Plans
 - Small groups in the 13 schools choose to do so
4. Time built into CPD to meet, teachers reluctant to miss their classes to do so. Process proved very demanding on the limited amount of time a teacher has in one day.
- Lesson Plans created by teachers meeting early in the morning before the start of the school day and after school time

Further complexities during the course of the Project's initial work (2008-2009)

5. Live observations/video recording to assess student understanding and post-lesson discussions based on observations were by and large lacking from the Lesson Study process.

Teachers who did collaborate

- Should be commended for time and effort put in by them.
- Sparked an increase in discussion & collaboration within their schools (NCCA, 2012).
- Lesson Plans modelled by those who had prepared them to teachers within school clusters at workshop 3.
- Shared on www.projectmaths.ie

Teachers who did collaborate

Gained by:

- Seeing how other teachers relate mathematics to real life
- Getting lots of ideas from other teachers
- Having the opportunity to meet and plan
- Sharing knowledge and experience
- Developing a more in-depth understanding of specific areas
- Forcing themselves to think wider and deeper.

(Survey Monkey)

Teachers found:

- Too time-consuming
- Were focused on trying to create favourable teaching and learning environments and designing pedagogies in line with the aims of Project Maths
- Gathered valuable ideas on initiatives tried by colleagues.

(Survey Monkey)

To be fair...Other forces which hindered the cultivation of Lesson Study

Concerns teachers had in relation to:

- Syllabus: Language & detail (not resistant to change and wanted to learn from what others knew and were doing to increase their knowledge & skills about the implementation of the new syllabus)
- High stakes Leaving Certificate
- Unpredictable exam
- Time: How to sequence materials
- Active Learning.

Considering the concerns & challenges in light of relevant research

Studies over last two decades (Hall & Hord 2011, amongst others) suggest that:

- Teachers' core beliefs about teaching and learning mathematics have a significant effect on implementing changes
- Teachers' concerns about changes in implementing new teaching practices and reformed syllabuses can serve as obstacles and prevent them from undergoing a significant change
- Difficult to change teachers' core beliefs, resolving their concerns about change can facilitate the implementation process of reformed syllabuses and teaching practices
- Teachers' concerns about change reveal much about the types of support they need in the process of adopting new classroom practices and syllabuses.

Need to acknowledge:

- the significance of teachers' concerns
- and address what questions teachers were asking and when they were asking them (in relation to syllabus and examination queries)
- that introducing Lesson Study in the first year in the midst of a new curriculum, new teaching practices new style of examination we were too keen to focus on student learning.

Implications for Lesson Study

- Kinds and content of professional development opportunities after 2008-2009 had to be informed by ongoing monitoring of the concerns of teachers.
- RDOs had to be sensitive to the questions teachers were asking and why they were asking them.
- Varying degrees of participant needs which had to be catered for on an ongoing basis.

After the first year of the introduction of Lesson Study:

- Lesson Study not a feature of CPD (2009-2012)
- 2009-2012 Workshops were planned as scheduled events within a sequence
- Workshops were interactive in nature with lecture style presentations kept to a minimum
- Follow-up support for ideas and practices introduced during workshops in the form of school visits continued
- New resources developed in line with the phased implementation of the syllabus
- Teaching & Learning Plans were modelled which exemplified key content and pedagogical knowledge
- Teachers were asked to implement these ideas in their classroom and during school visits purposeful collaboration took place.

After the first year of the introduction of Lesson Study contd.

- Teachers exchanged ideas on school visits with their colleagues and RDOs on what was working in their classroom.
- During this period (2009-2012) a more progressive desire became evident among the teachers in the project schools for recurrent cooperation, ongoing collaboration and effective teamwork.
- RDO's role broadened immensely over the first four years (2008-2012): From deliverers to facilitators, assessors of where teachers were at, mediators of learning, designers of materials and trainers where appropriate.

Gains of introducing Lesson Study in the first year:

- department meetings now focused on teaching and learning issues
- these discussions tackled teachers' insulation and isolation and allowed colleagues to upskill each other on content as well as methodologies.

Insights into Lesson Study in an Irish context

- Lesson Study is a process not a set of techniques.
- Likewise introducing it is a process not an event.
- To introduce it in the first year was to seek to change too rapidly the quality of learning experienced by students.
- Teachers' concerns regarding a new syllabus, a new exam structure and new classroom practices takes a number of years to be successfully addressed.

Insights into Lesson Study in an Irish context contd.

- Lesson Study goes far beyond teacher or school: it is a highly personal experience.
- Teachers' concerns regarding syllabus and exams were legitimate and natural given that the terminal examination is such a high stakes exam.
- Teachers in the project schools were all engaged in implementing curriculum change, they had different paces and vastly different needs for support along the way,
- Implementation of new syllabus, teaching practices and style of exams affects teachers' competence, comfort, control and confidence (NCCA, 2012).

Initiate Lesson Study again..

- Initial year (2008-2009) Lesson Study introduced
- Withdrawal lasted for three years (2009-2012)
- A decision taken by TES, NCCA and PMDT to initiate Lesson Study again for 2012-2013.

Initiate Lesson Study again..

Reasons were an increased:

- collaboration between teachers in the project schools
- knowledge and skills teachers gained about the implementation of the new syllabus
- familiarity teachers had in the reformed examination structure
- Understanding teachers had with the resources developed
- Belief that the new methodologies offered additional learning benefits over drill and practice.

(In-House Reports, NCCA, 2012)

Initiate Lesson Study again..

- TES approved substitution for two days for each teacher in the project schools (2012-2013).
- Provided teachers with the time needed to carry out Lesson Study over the full academic year.

Initiate Lesson Study again..

Prior to commencing Lesson Study in September 2012:

- School visits were scheduled for the full academic year (21 out of 23 project schools wanted to engage in Lesson Study).
- Teachers of mathematics in each school were organised into research groups.
- Each group identified a teaching and learning theme on which to focus their Lesson Study.
- In total fifty-two research groups organised across twenty one project schools.
- Twenty-five presentations at Conference.

Adapting but keeping faithful to key principles underlying Lesson Study

- Identify goals for student learning and long-term development - collaboratively plan a research lesson that will be observed to bring these goals to life.
- One planning team member teaches the lesson while other team members collect data on student thinking, learning, engagement etc.
- Share and analyse data collected, what is the evidence that goals for student learning and development were fostered- What improvements to the lesson and to teaching more generally should be considered?
- Write report that includes lesson plan, student data and reflections on what was learned. If desired refine and re-teach the lesson.

Presentations will bring together

- Focus of Lesson and Collaborative Planning
- Teaching and Observing
- Analytic Reflection:
 - a) What was learned about students' understanding based on data collected
 - b) What was noticed about own teaching.
- Ongoing Revision
- **Strengths & Weaknesses** of adopting the Lesson Study process

Conclusion

- Lesson Study has an important role to play in the project schools and beyond in Ireland.
- It is an innovation teachers need to understand deeply and practise on a regular basis through mutual support if they are to avail of it fruitfully.

