Learning in the Classroom of the Future

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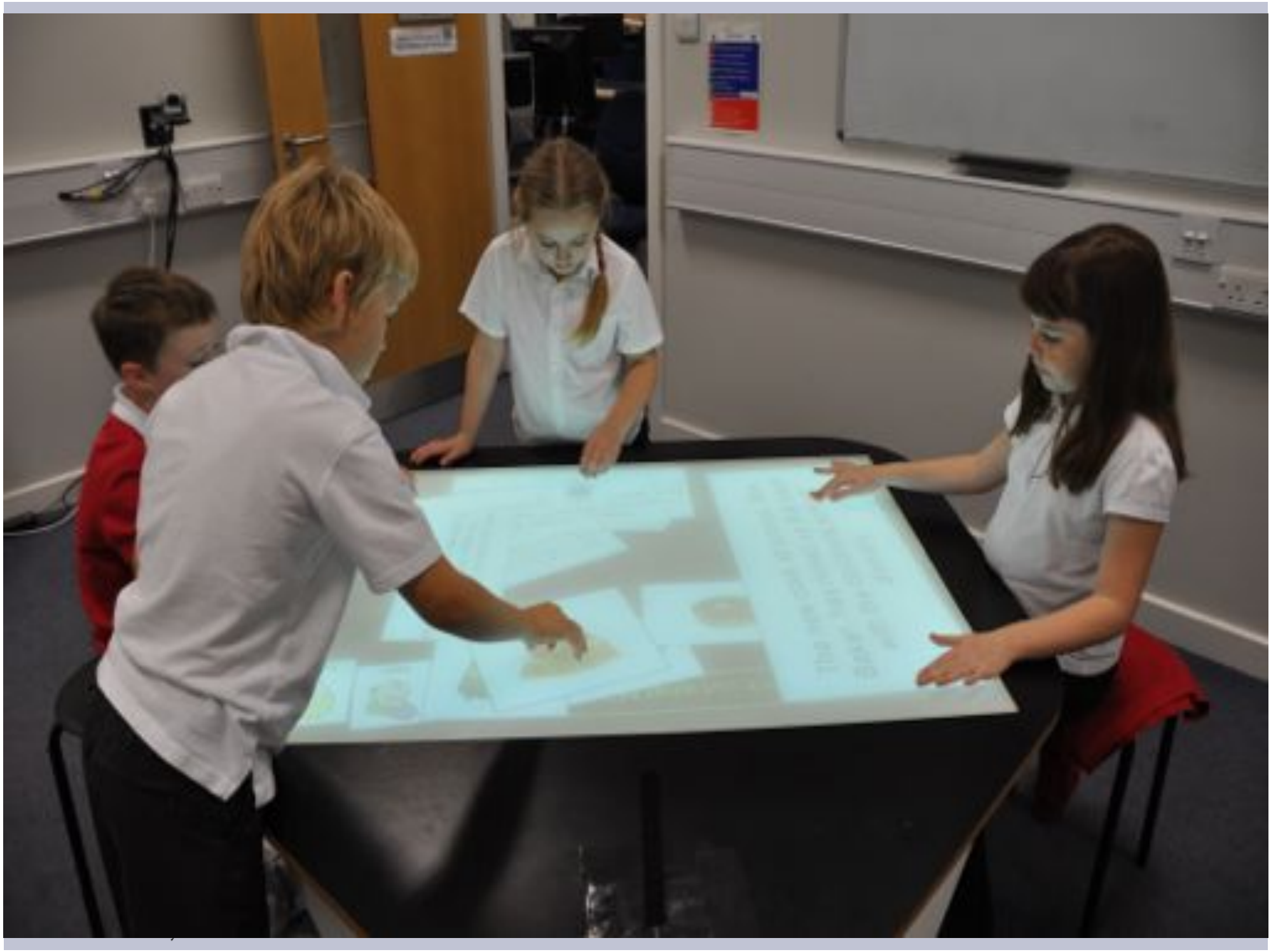

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Network Flick

http://www.youtube.com/watch?v=G4BhQtcjE3g&list=PL3A2C3D35C1883FD4&index=1

Classroom Use

http://www.youtube.com/watch?v=XjEAVpnrm4s&list=PL3A2C3D35C1883FD4&index=9

Collaboration & CSLC in Classrooms

- Collaboration is beneficial for learning and problem solving (Barron & Darling-Hammond, 2008; Dillenbourg et al, 1996; O'Donnell, 2006)
- Variability in outcomes both within and across studies (Slavin, 1990; Barron, 2003)

Collaboration & CSLC in Classrooms

- Typical classroom
  - 67% teacher-led whole-class interaction
  - 18% individual work
  - 15% ‘group’ work (UK, 10-11 year olds: Higgins et al. 2005)

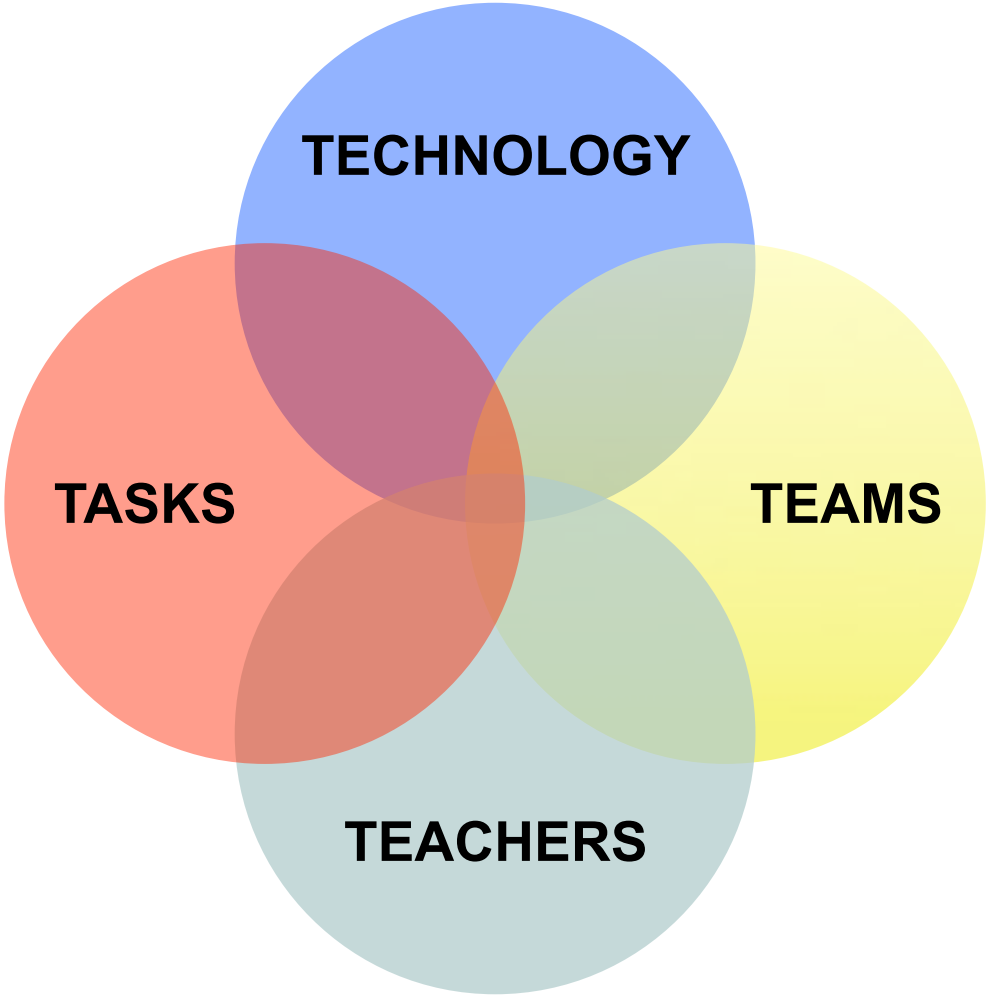
- Even when students sit in groups, they don’t work in groups (Blatchford et al, 2003)

Collaboration & CSLC in Classrooms

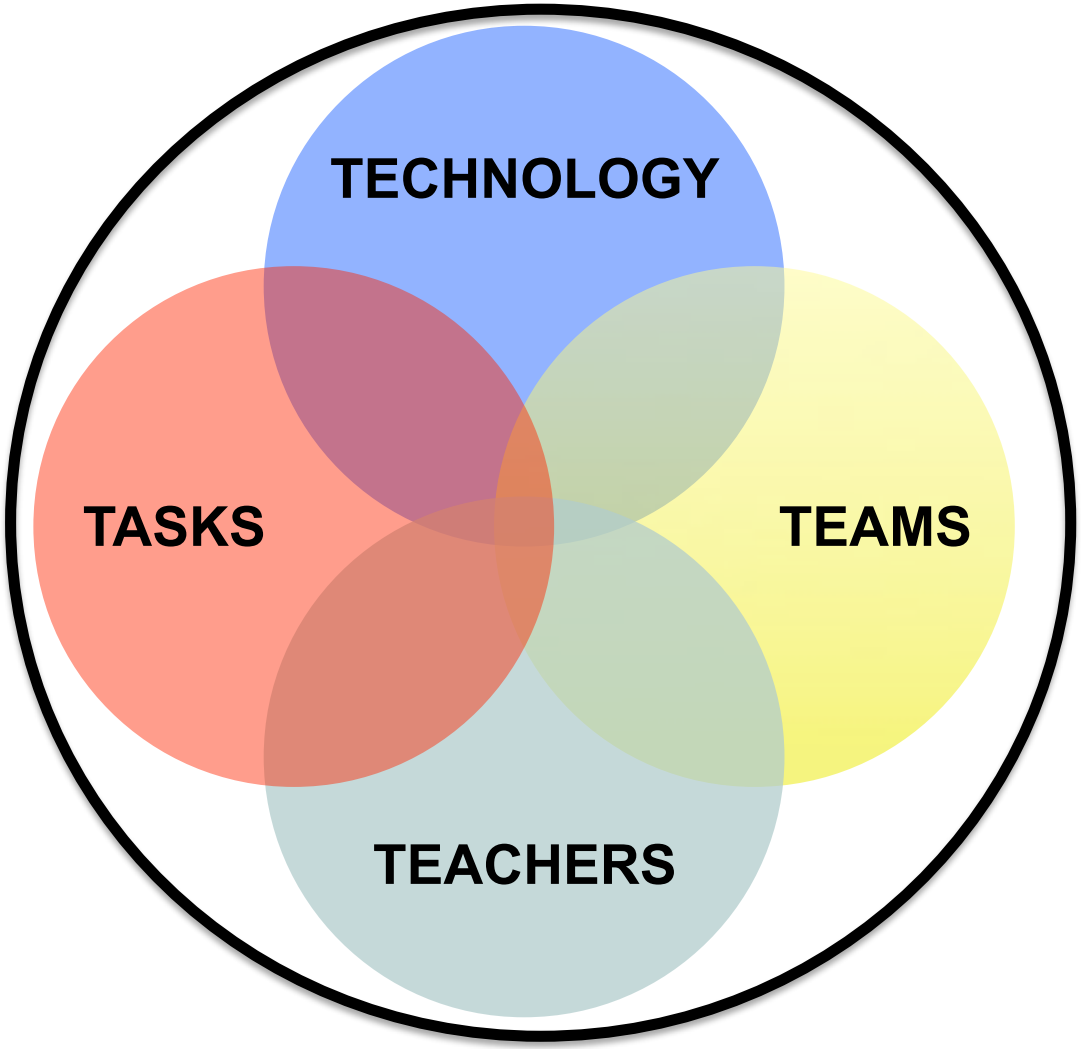
- Majority of research is on isolated groups, or single groups, not multiple groups within classrooms (Dillenbourg & Jermann, 2010)

- Relatively little research on what teachers should be doing during collaborative learning activities and what types of intervention are most effective (Webb, 2009)

4 Ts of CSCL



4 Ts of CSCL in the Classroom Context



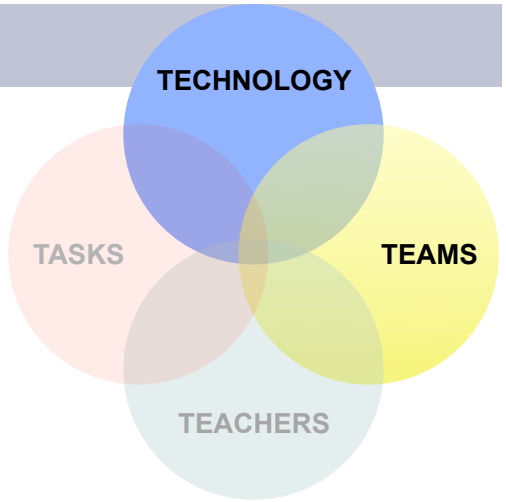
Data

- Study 1: Comparison of 8 groups working on a single MTT and paper (history and maths mysteries)
- Study 2: Six classes of students using MTT classroom (96 students; 24 groups)
  - 2 teachers
  - 2 room orientations
  - History & Maths mysteries
- Study 3: 2 classroom teachers with their own classes for 2 days (mysteries & NumberNet)

Mysteries (Leat & Higgins, 2002)

- Pedagogic strategy that focuses on
  - Collaboration
  - Thinking skills
  - Argumentation
- Question and series of clues
- Convergent or Divergent Tasks

Technology & Teams

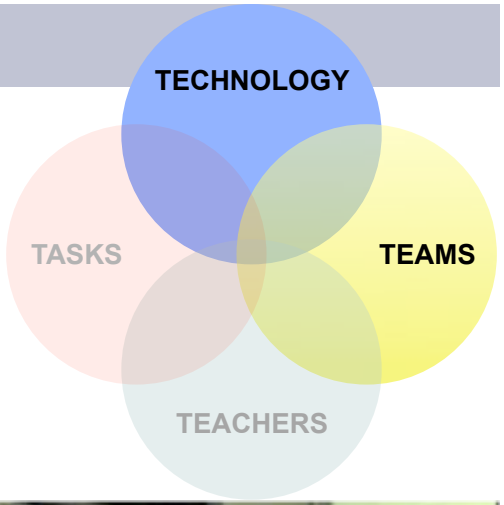


Question:

Does the technology support

- the learning outcomes?
- the collaborative interactions?

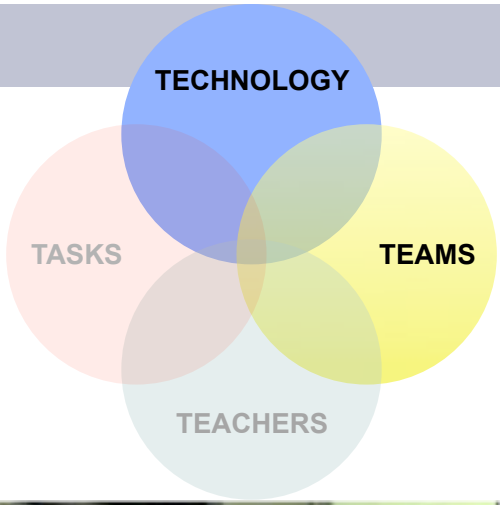
Technology & Teams



- Study 1:
  - All groups solved the tasks (with teacher intervention)
  - Slightly higher levels of reasoning in history task in MTT condition

Higgins, Mercier, Burd, & Joyce-Gibbons. (2012) Multi-touch tables and Collaborative Learning. British Journal of Educational Technology.

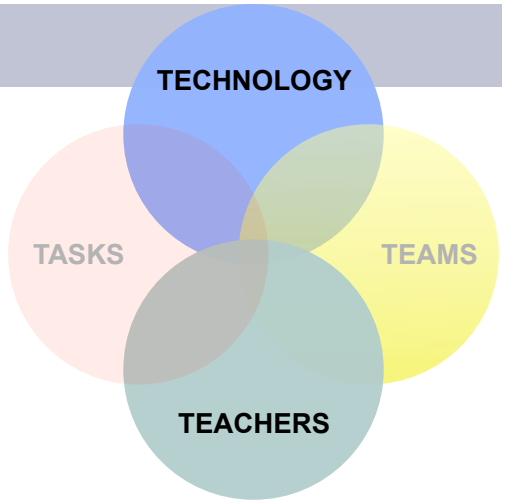
Technology & Teams



- Study 1:
  - More joint attention with MTT
  - More quickly developed a joint problem space
  - More interactive discussion in MTT condition

Higgins, Mercier, Burd, & Joyce-Gibbons. (2012) Multi-touch tables and Collaborative Learning. British Journal of Educational Technology.

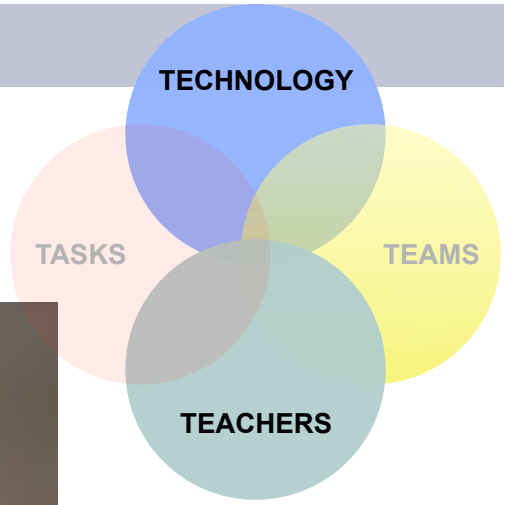
Technology & Teachers

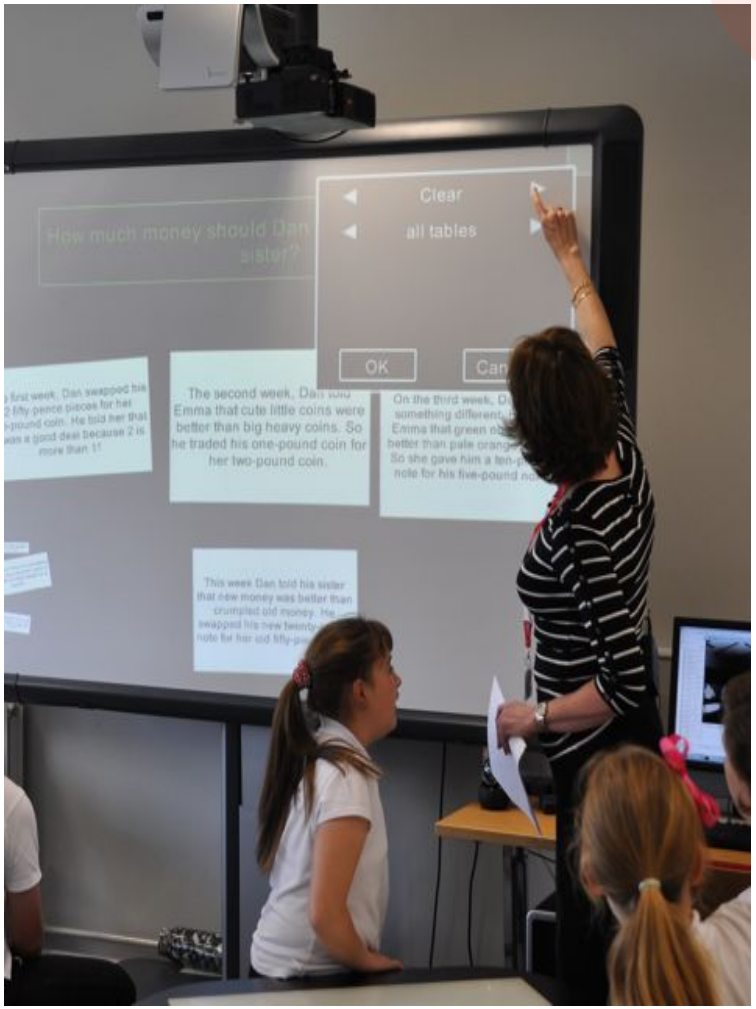


Question:

What tools can help the teacher orchestrate learning in the collaborative classroom?

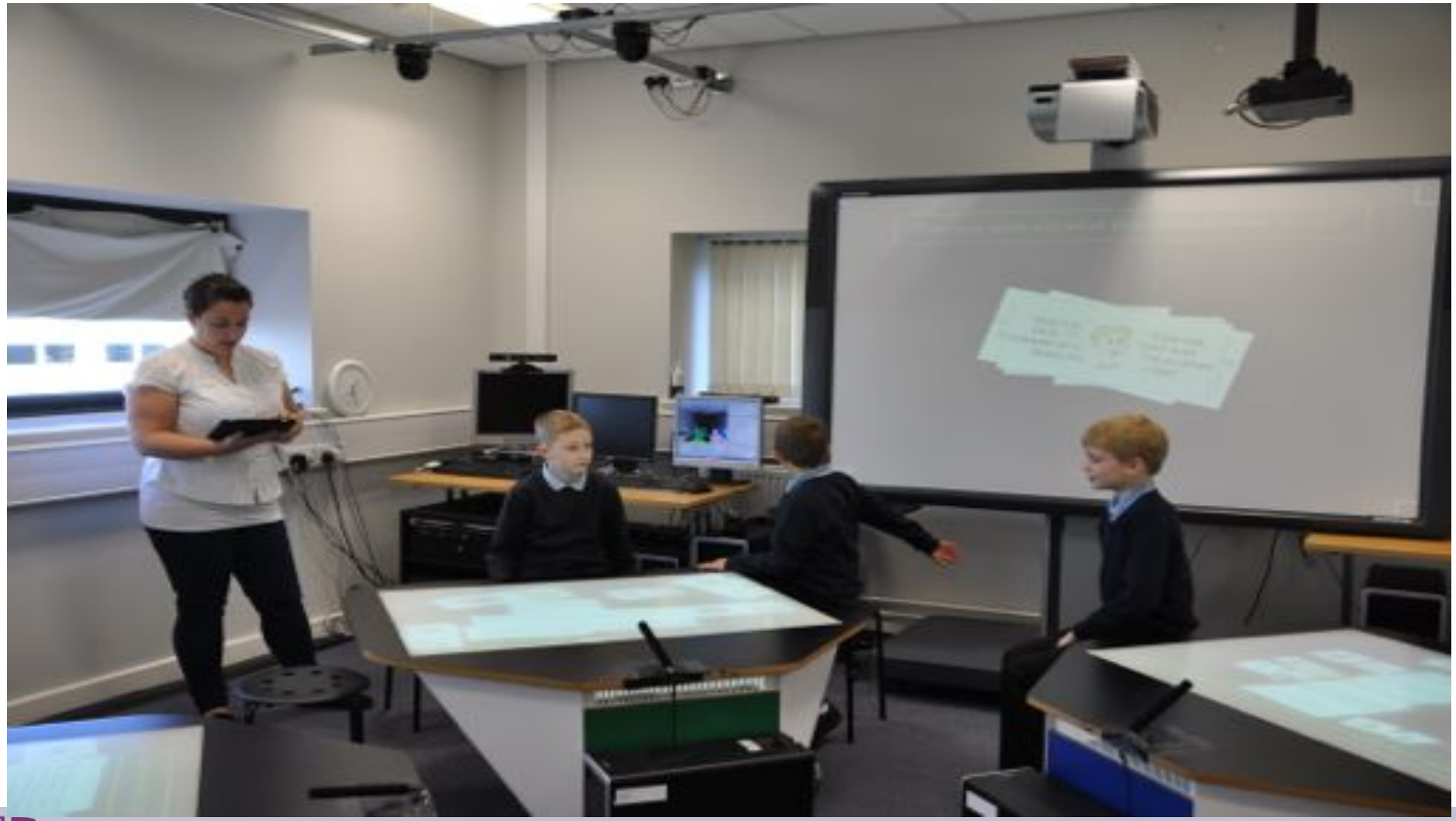
Technology & Teachers





Mercier, McNaughton, Higgins & Burd, (2012) Orchestrating Learning in the Multi-touch Classroom: Developing Appropriate Tools. In M. Evans (chair) Interactive Surfaces and Spaces: A Learning Sciences Agenda. ICLS2012

Technology & Teachers



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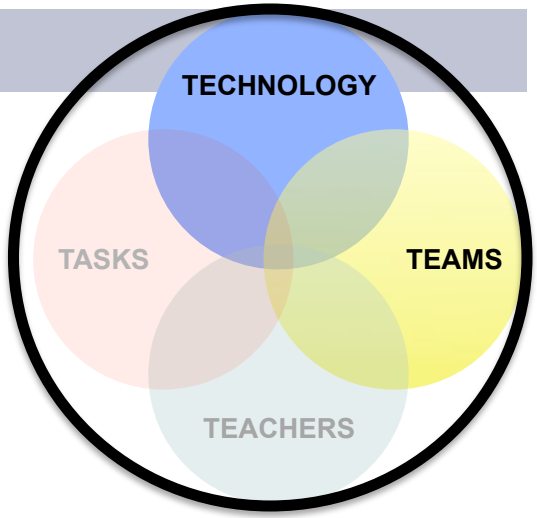
Technology & Teachers

Technology & Teams in the Classroom



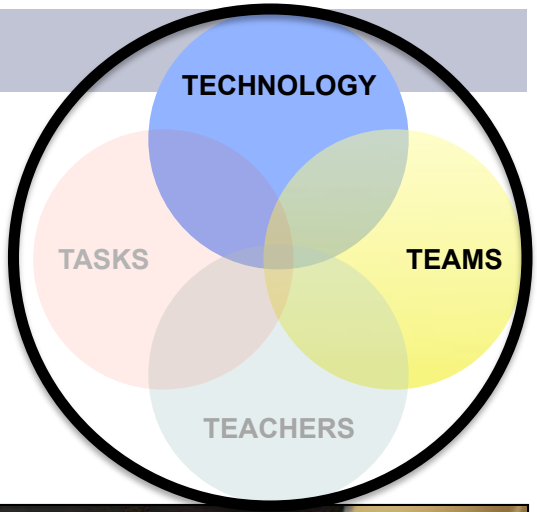
Question:

Does the arrangement of the technology support

- the collaborative interactions?
- the learning outcomes?

Mercier & Higgins (2012) The Impact of Classroom Configuration on Collaborative Learning. Paper presented at AERA

Technology & Teams in the Classroom



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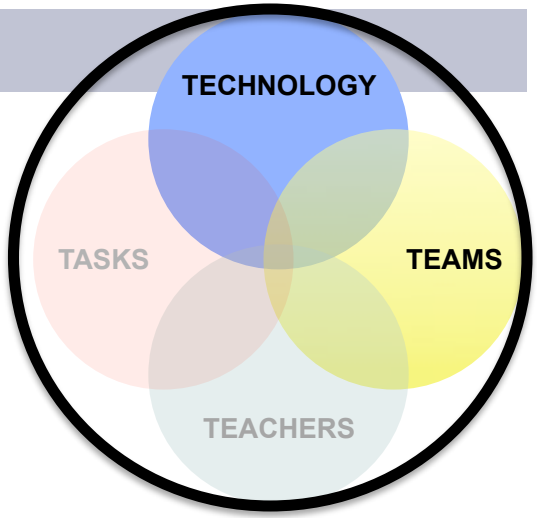
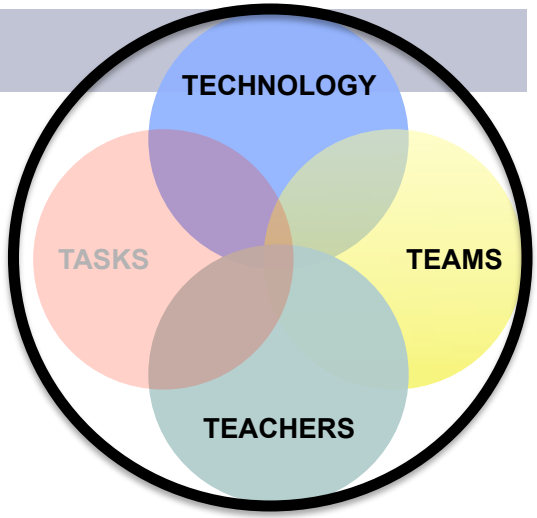
Technology & Teams in the Classroom



- Significantly more talk in centered room
- More correct answers in traditional room
- No difference in off-topic talk
- Indicates higher levels of collaborative engagement in centered classrooms

Mercier & Higgins (2012) The Impact of Classroom Configuration on Collaborative Learning. Paper presented at AERA

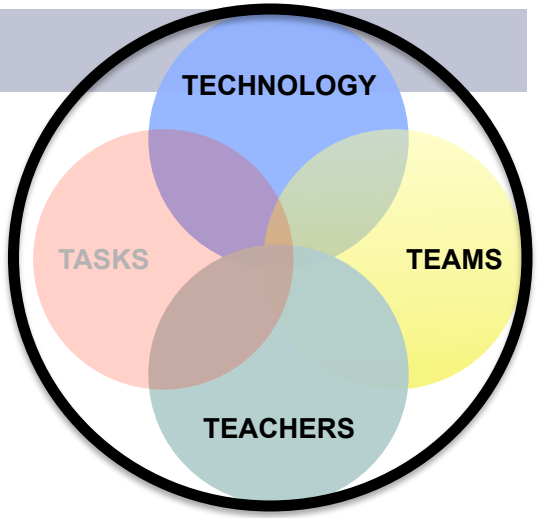
Teacher, Technology & Teams in the Classroom



Question:

What sort of impact does whole-class discussion have on the groups?

Method



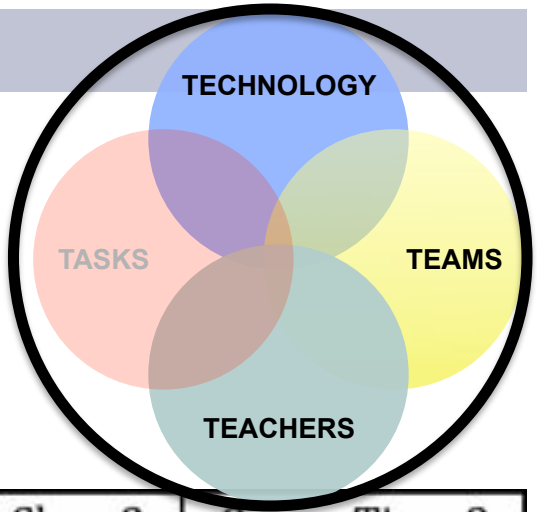
- Study 2
- 6 school groups (96 children)
- 30 minute long history mystery
  - 3 small-group sessions
  - 2 whole-class sessions
- Reasoning coded using SOLO taxonomy
  - Prestructural
  - Unistructural
  - Multi-structural
  - Relational
  - Extended Abstract

Teacher, Technology & Teams

	Group Time 1	Group Time 2	Group Time 3
Yadstone Red	Prestructural	Prestructural	Unistructural
Yadstone Blue	Multi-structural	Multi-structural	Relational
Yadstone Green	Unistructural	Unistructural	Multi-structural
Yadstone Yellow	Unistructural	Unistructural	Prestructural
Benbrook Red	Unistructural	Unistructural	Extended Abstract
Benbrook Blue	Multi-structural	Multi-structural	Extended Abstract
Benbrook Green	Relational	Relational	Relational
Benbrook Yellow	Unistructural	Unistructural	Unistructural
Shadbrook Red	Multi-structural	Multi-structural	Relational
Shadbrook Blue	Prestructural	Prestructural	Unistructural
Shadbrook Green	Multi-structural	Unistructural	Multi-structural
Shadbrook Yellow	Unistructural	Unistructural	Unistructural

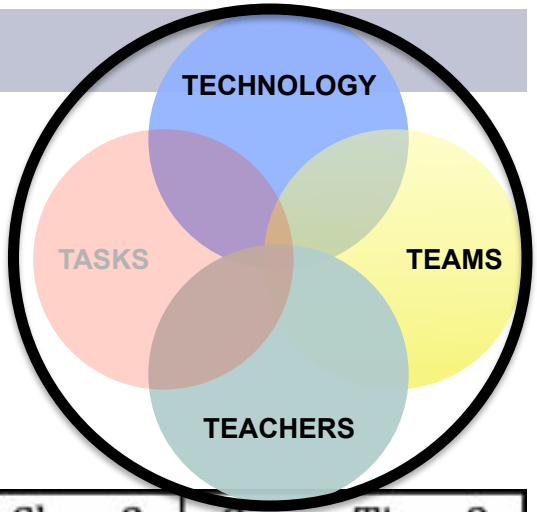
Mercier, Higgins, Burd & Joyce-Gibbons (2012) Multi-Touch Technology to Support Multiple Levels of Collaborative Learning in the Classroom. ICLS 2012

Benbrook



	Group Time 1	Whole Class 1	Group Time 2	Whole Class 2	Group Time 3
BLUE	Multi (3)	MULTI 3	Multi (3)	RELATIONAL 4	EA (5)
RED	Uni (2)		Uni (2)		EA (5)
YELLOW	Uni (2)		Uni (2)		Uni (2)
GREEN	Relational (4)		Relational (4)		Relational (4)

Benbrook Red



	Group Time 1	Whole Class 1	Group Time 2	Whole Class 2	Group Time 3
RED	Uni (2)	MULTI	Uni (2)	RELATIONAL	EA (5)

Benbrook Red

- Group Time 1 & 2: reading clues, making comments about their value
- Some collaboration issues during 1 & 2
- Make contributions during Whole Class 2
- More on-task interaction in Group Time 3
- Uni- and Multi-structural comments build to EA.

Benbrook Blue

	Group Time 1	Whole Class 1	Group Time 2	Whole Class 2	Group Time 3
BLUE	Multi (3)		Multi (3)		EA (5)

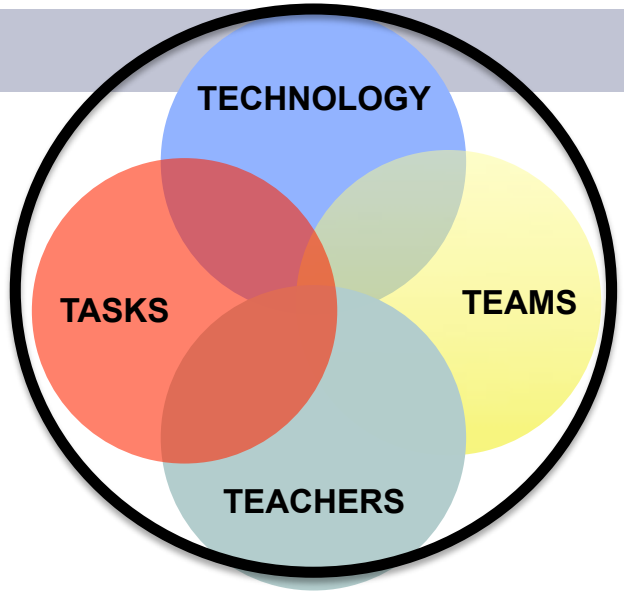
Benbrook Blue

- Group Time 1 & 2: Read and discuss clues
- Mostly on-task interaction
- Make relational level contributions in Whole Class 2
- Build on these contributions in Group Time 3

Conclusions

- No real evidence of uptake of ideas from whole class discussion.
- Suggestion that teacher signaling has an influence.
- Evidence that contributing to the whole class discussion is associated with higher levels of reasoning in the subsequent
  - The whole-class contributor isn't the only one who develops the ideas in the group

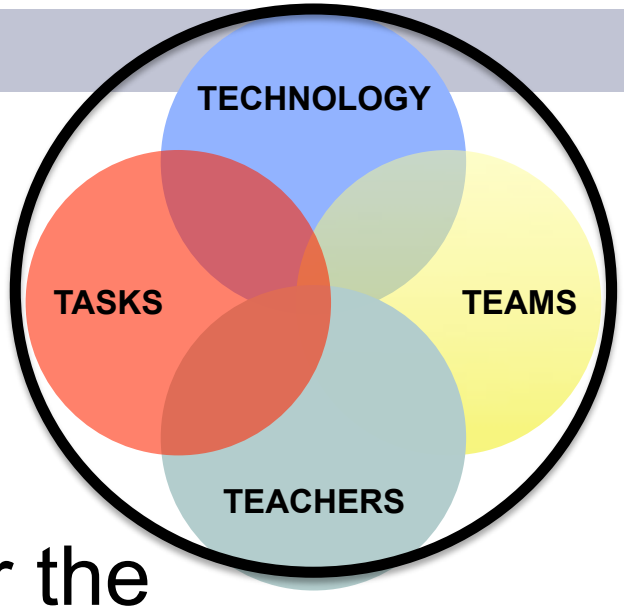
Summary



- Multi-touch supports interactions
- Access to teacher controls

  an issue and needs further exploration
- Placement of technology within the classroom influences collaboration and learning
- Teacher intervention and whole class discussion can influence small group interaction.

Conclusion



- Exploration of CSCL tools for classrooms needs to consider the interaction between 4Ts.
- The interaction of tasks, teachers, teams and technology occurs within the context of between group, whole-class and teacher-led interactions