循证教育研究：推理逻辑和质量标杆

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我的经验与局限

- 我的经验
  - 自己在国内以及国外的跨学科研究经历：学习科学、教育心理、教育技术、科学教育、课堂实践
  - 《学习科学杂志》副主编/主编以及AERJ、ijCSCL、ETR&D等杂志的审稿
  - 项目审阅/职称评审
  - 对东西方教育研究方法的对比反思
- 局限
  - 教育的哪学、历史和比较……

发言内容

1. 对教育研究的反思：我们的发表物在贡献什么？

2. 循证研究的逻辑和质量标杆：何以能够深入、严谨？

3. 总结与启示

1. 对教育研究的反思：我们的发表物在贡献什么？

……问题挑战

……实践启示

……设计实施

……文献回顾

理论/原则

实证研究

旨在推动

- 知识发展（new conceptual, design, and practical knowledge）
- 基于知识的实践改进与创新

《教育研究》与 《美国教育研究杂志》

Table 8. Frequency and percentage of article formats/styles in each journal.

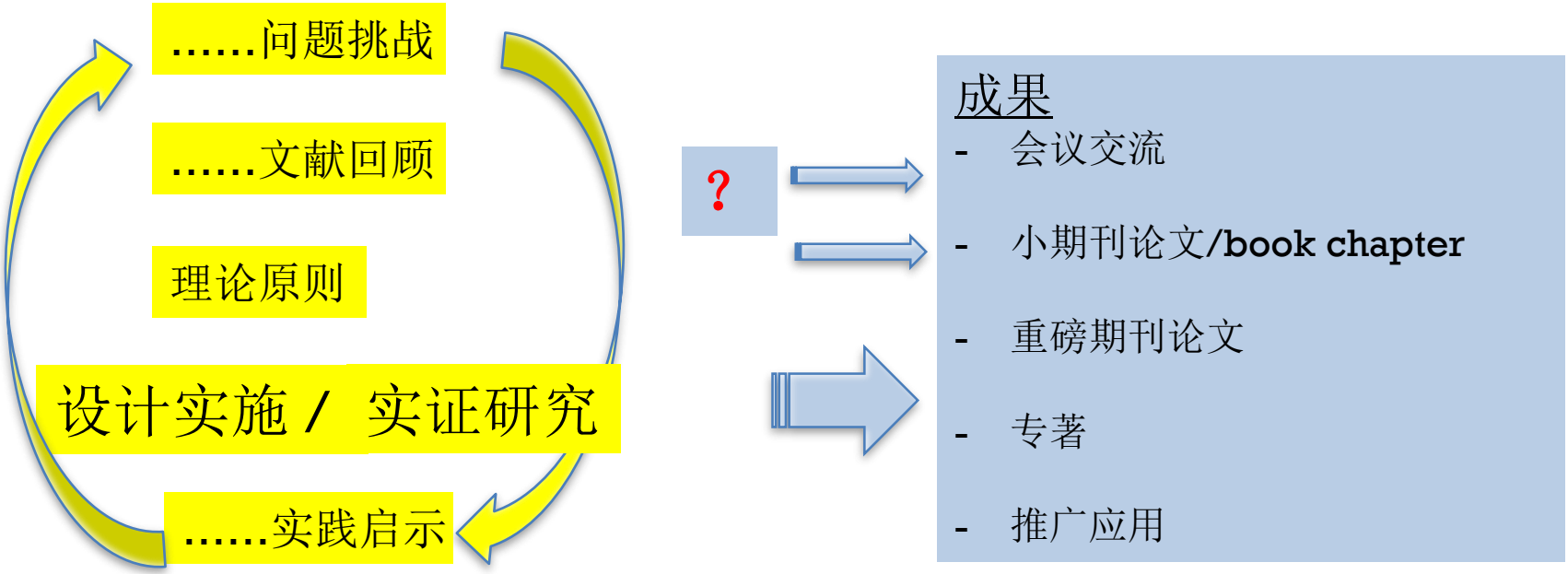
	《教育研究》		《美国教育研究杂志》	
Article formats	Frequency	Percent[a]	Frequency	Percent[a]
Research report	42	14.9	54	93.2
Conceptual paper	157	55.7	2	3.4
Policy report	12	4.3		
Literature review	2	.7		
Practical paper	3	1.1		
Historical discussion/paper	26	9.2	2	3.4
Commentary	40	14.2		
Total	282		58	

[a]Percentages do not add up to 100% due to rounding.

Zhao, Y., Zhang, G., Yang, W., Kirkland, D.E., Han, X., Zhang, J. (2008). A comparative study of educational research in China and the United States. *Asia Pacific Journal of Education, 28* (1), 1 – 17

如何提升教育研究的质量？

- 提升实证/循证研究在整体教育研究中地位和分量
  - 有效使用质的、量的、混合的方法
- 不是减少而是深化理论建构：以理论引领实证，以实证深化推进理论
- **循证研究不是另一类研究，而是更进一步的研究方式。各类文章所代表的“研究要素”共同支持循证探究过程！**



2. 循证研究的逻辑和质量标杆：循证教育研究何以能够深入、严谨？

2.1 每个具体研究和报告如何能深入和严谨？

2.2 如何形成持续的研究体系（research program），不断跟进、夯实、升华、集成和拓展？

2.1 每个具体研究和报告如何能深入和严谨？

两个核心逻辑和质量标杆

- 清晰透明的探究逻辑
  A clear and transparent logic of inquiry
- 信实的论证逻辑
  A persuasive logic of argument to warrant claims

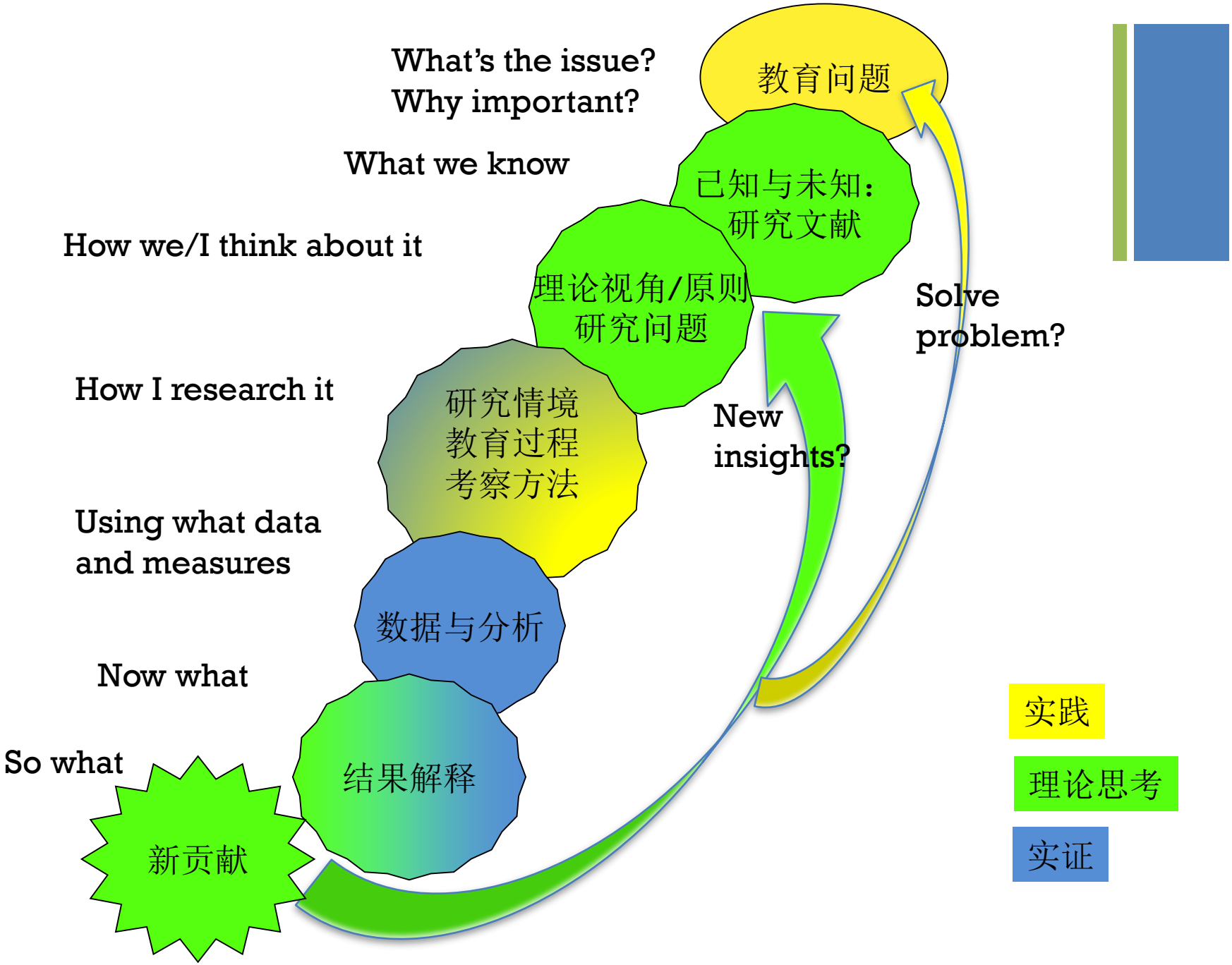
AERA (2006). **Standards for Reporting on Empirical Social Science Research in AERA Publications.** *Educational Researcher, 35*, 33–40.

清晰透明的探究逻辑
A clear/transparent logic of inquiry

- Research reporting should follow a clear ***logic of inquiry*** and activities that led from the development of the initial interest, topic, problem, or research question; through the definition, collection, and analysis of data or empirical evidence; to the articulated outcomes of the study.

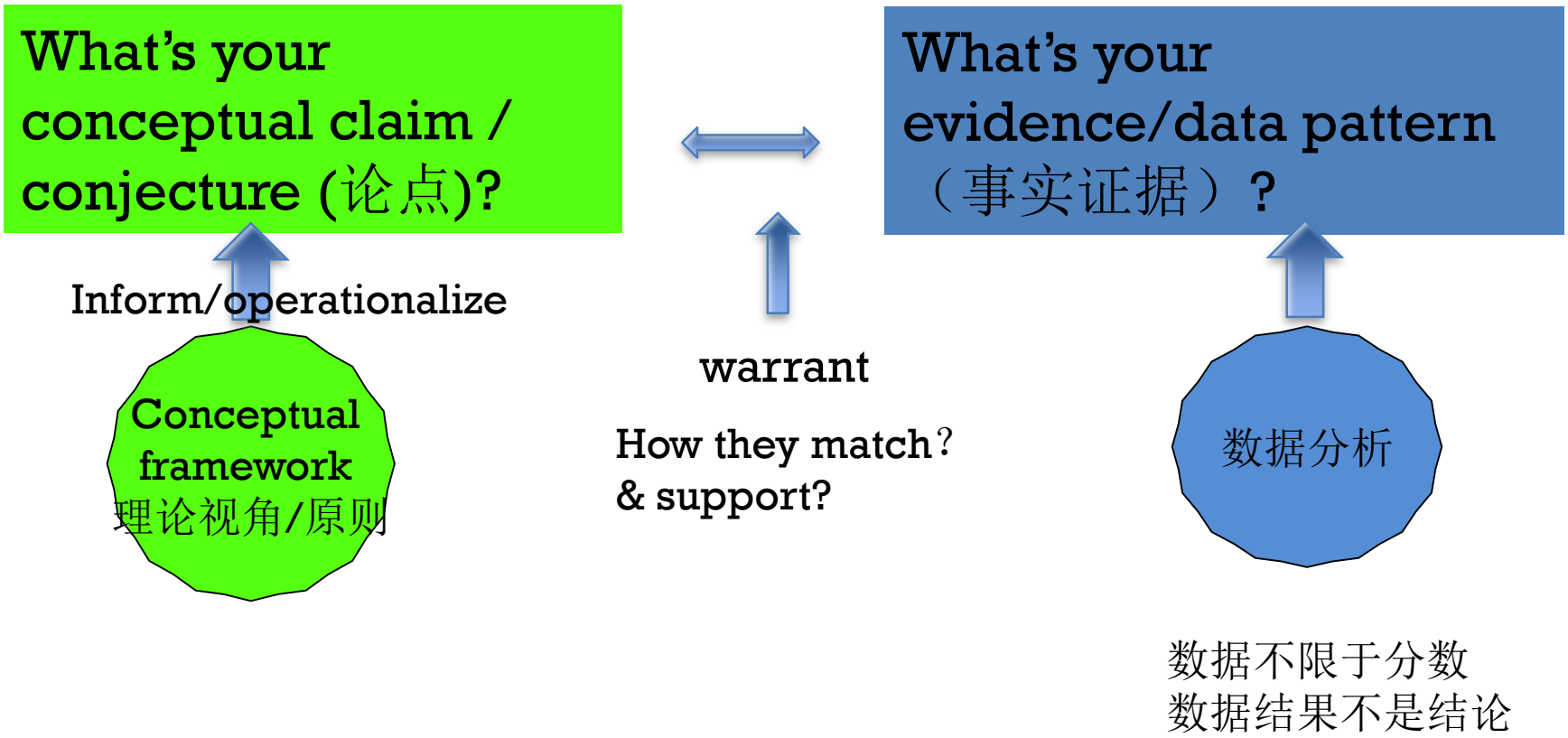
但不是线性的流程

AERA (2006).


What's the issue?
Why important?
教育问题
What we know
已知与未知：
研究文献
How we/I think about it
理论视角/原则
研究问题
Solve
problem?
How I research it
研究情境
教育过程
考察方法
New
insights?
Using what data
and measures
数据与分析
Now what
结果解释
So what
新贡献
实践
理论思考
实证

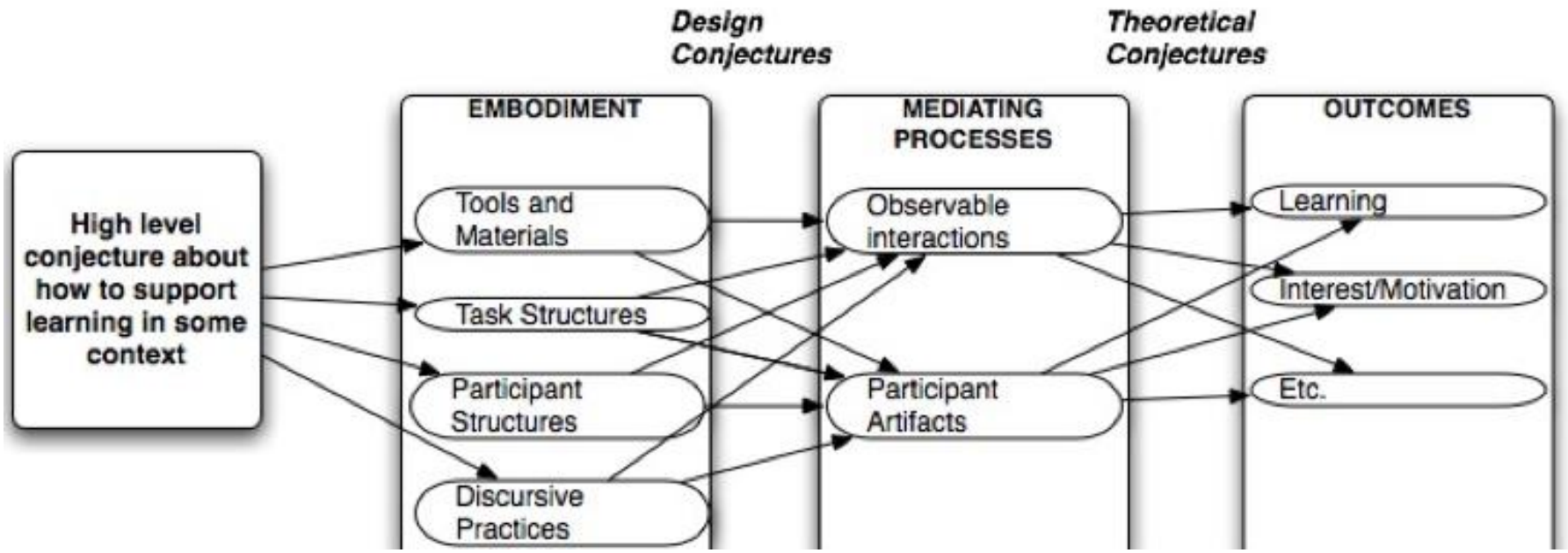
信实的论证逻辑

A persuasive logic of argument to warrant claims



Conjecture Mapping

(Sandoval, 2014, Journal of the Learning Sciences)



高层理论原则/假定

具体化的设计实施原则

相应的过程与结果考察维度

研究论文评审的核心尺度

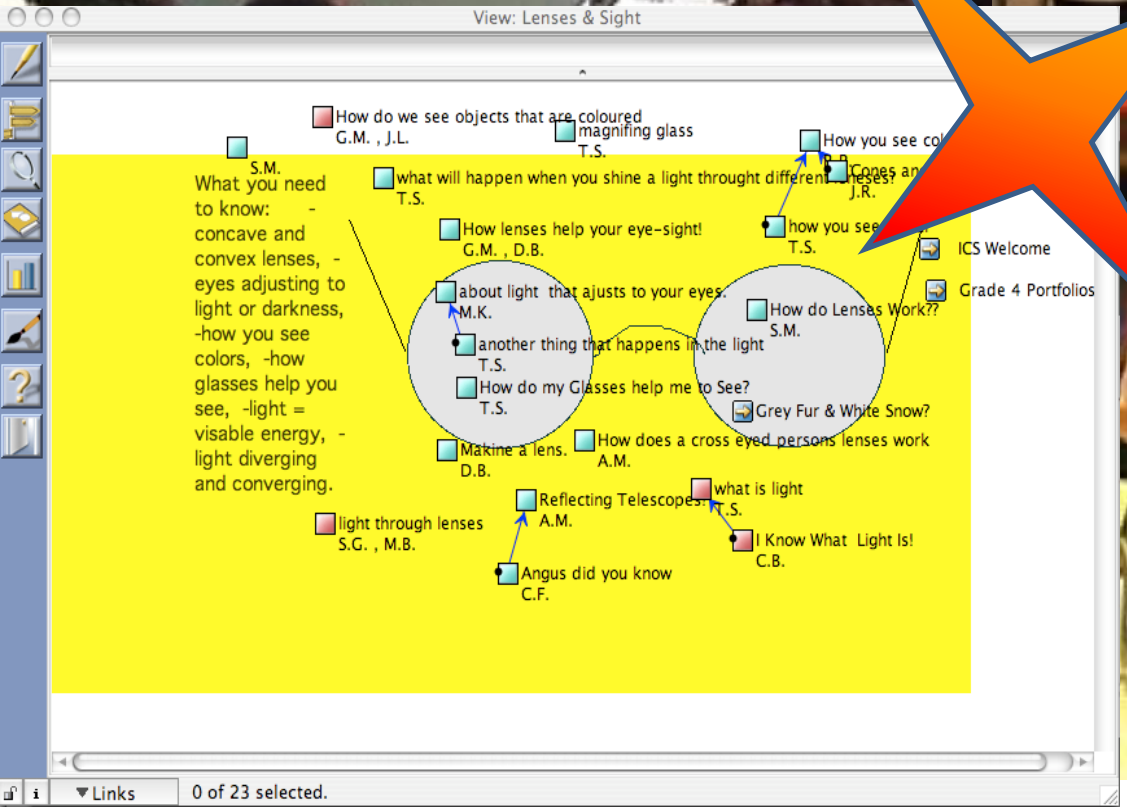
- 每个研究要素/环节都清晰、明确、合理
  - **It's unclear to me…?**
- 相互连贯一致，环环相扣
  - **I don't understand how…aligns with …?**
- 理论-具体假定-数据分析-结果的推理链
  - Clear/specific claim, grounded in theory, well supported by data

具体实例：

怎样的协作方式能支持共同知识建构需要的社会认知互动？

- 持续三年的基于设计的研究
  A 3-Year Design-Based Research
- Participants: 22 fourth-graders and their teacher
- Curriculum unit:
  - Optics
  - 4 months

- Zhang, J., Scardamalia, M., Reeve, R., & Messina, R. (2009). Designs for collective cognitive responsibility in knowledge building communities. Journal of the Learning Sciences, 18(1), 7–44.


View: Lenses & Sight
How do we see objects that are coloured
G.M. , J.L.
magnifing glass
T.S.
S.M.
What you need to know: - concave and convex lenses, - eyes adjusting to light or darkness, -how you see colors, -how glasses help you see, -light = visable energy, - light diverging and converging.
what will happen when you shine a light throught different
T.S.
How lenses help your eye-sight!
G.M. , D.B.
about light that ajusts to your eyes.
M.K.
another thing that happens in the light
T.S.
How do my Glasses help me to See?
T.S.
Makine a lens.
D.B.
light through lenses
S.G. , M.B.
Reflecting Telescopes
A.M.
Angus did you know
C.F.
how you see
T.S.
How do Lenses Work??
S.M.
Grey Fur & White Snow?
How does a cross eyed persons lenses work
A.M.
what is light
T.S.
I Know What Light Is!
C.B.
ICS Welcome
Grade 4 Portfolios
Links
0 of 23 selected.

Knowledge Building Theory:

Collective cognitive responsibility (Scardamalia, 2002)

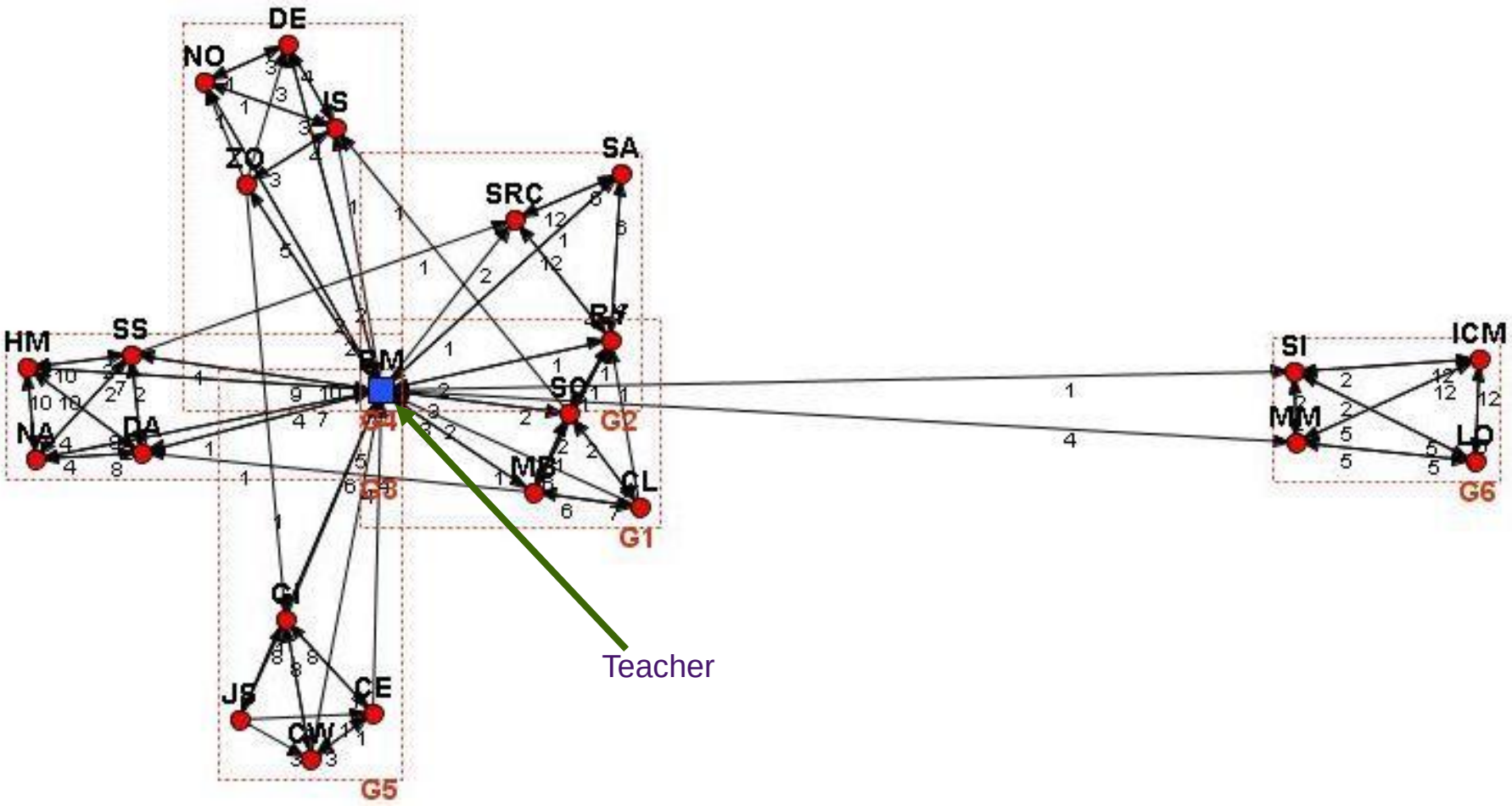
表现维度	具体分析
Community awareness	Percentage of notes and percentage of inquiry threads read per student; density of the note reading as reflected in who read whose notes.
Complementary contributions	Percentage of notes linked through building-on, rising-above, or reference to other authors; density of the note linking network reflected in who linked to whose notes; cliques as reflected in note linking; Co-participation in different inquiry threads (for the third year only).
Distributed engagement	Centralization measures that indicate degree of inequality or variance among members in a network; Analyses of teacher-student exchanges; Analysis of students' roles in inquiry threads (for the third year only).

高层理论与原则　　具体化

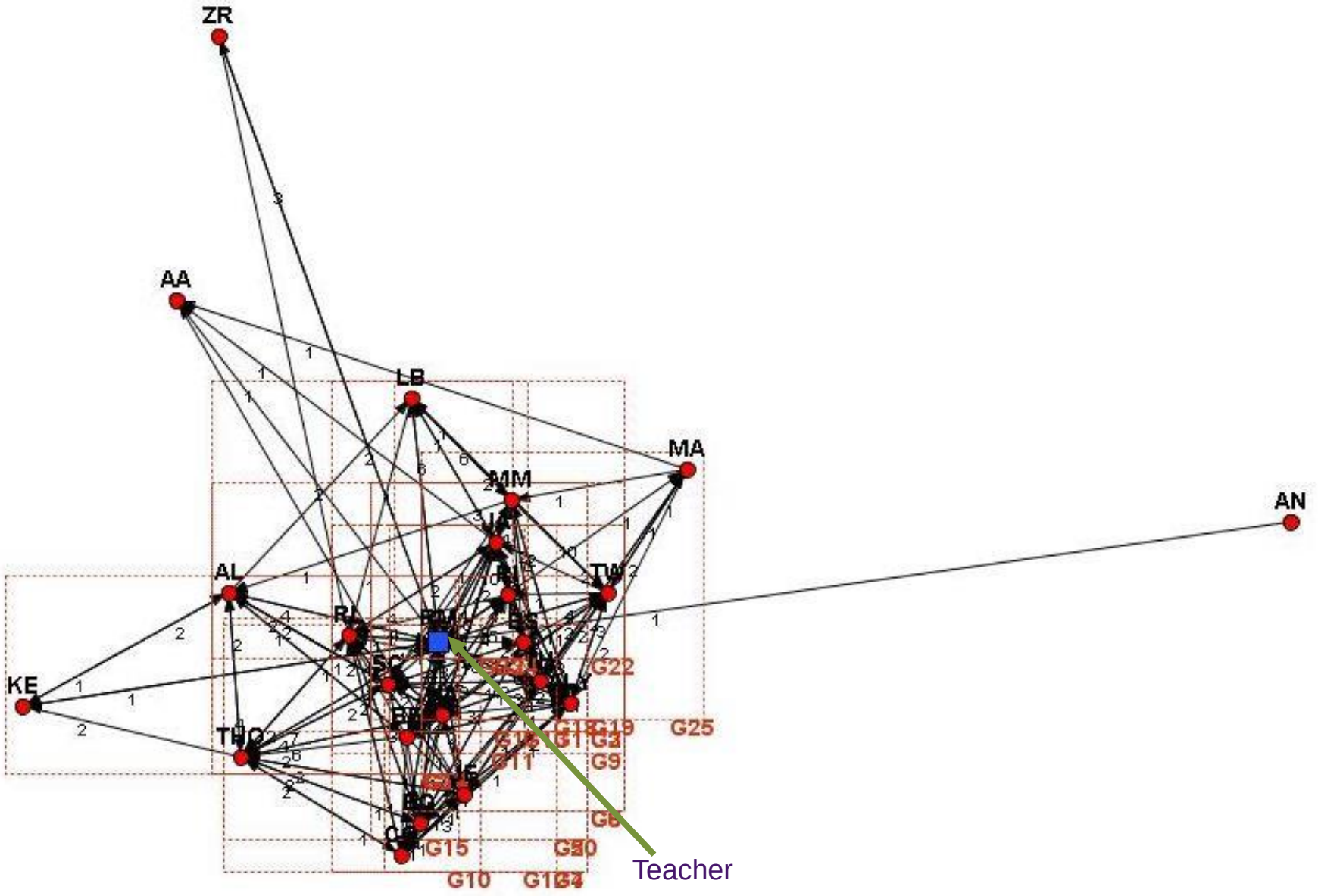
相应的过程与结果考察维度

交互回应关系

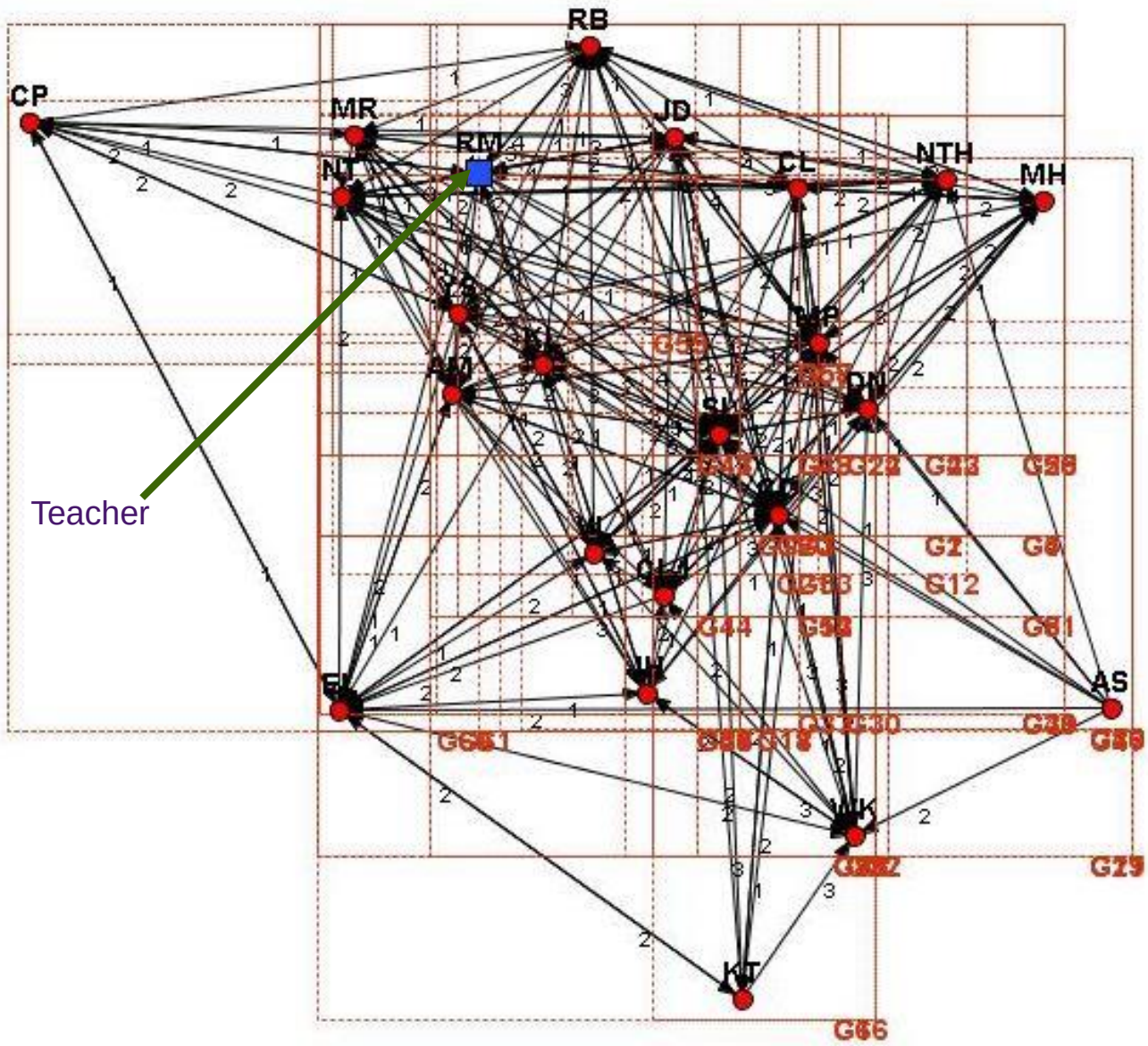
Cliques (sub-communities)



固定小组 Year 1: Specialized-group



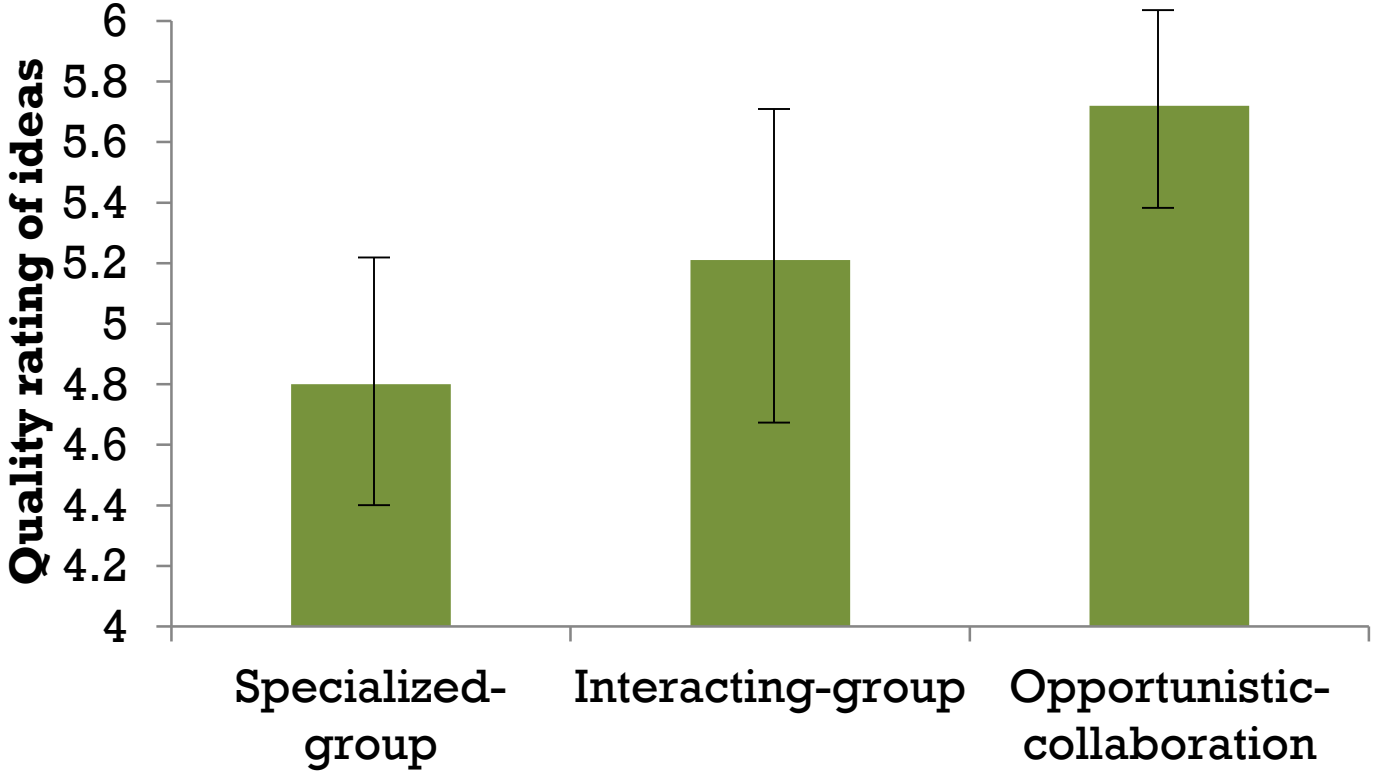
互动小组 Year 2: Interacting-group



动态机遇性协作 **Year 3: opportunistic-collaboration**

理解深度分析

Depth of Understanding



Student ideas were rated based on *scientific sophistication* and *epistemic complexity* ($F(2, 63) = 5.69$, $p < .01$, $\eta^2 = 0.15$).

如何形成持续的研究系列和体系（research program）？

- 持续、多阶段的研究，理论-实证交互推进
  - **A "pipeline" of evidence** that supports continual conceptual advancement, design innovations, and practice-based improvement.

循序非线性渐进的研究阶段

- Focused **foundation research; early-stage/exploratory research,**
- Cycles of **design and development research** of new interventions, strategies, and technologies,
- Larger **effectiveness and efficacy research,**
- **Scale-up research**

Common Guidelines for Education Research and Development

A Report from the Institute of Education Sciences, U.S. Department of Education and the National Science Foundation, 2013.

我自己的研究序列和轨迹

在 (Zhang et al, 2009)基础上，进一步的研究学习驱动的动态协作：

- **Exploratory & design research**：学生驱动的动态探究需要何种引导支持结构？

How can student-driven, dynamic inquiry become supported and organized?

Zhang et al. (2018). Co-Organizing the Collective Journey of Inquiry With Idea Thread Mapper. *Journal of the Learning Sciences.*

Tao, D., & Zhang, J. (2018). Forming shared inquiry structures to support knowledge building in a Grade 5 community. *Instructional Science.*

- 进一步的问题：

Design & development: 如何设计技术环境支持动态持续探究和知识建构？

集体思维脉络

Idea Thread Mapper (ITM)

where ideas grow and flow

https://idea-thread.net (Zhang et al., 2012, 2018)

进一步的问题：

如何将知识建构拓展为跨班级、跨学年互动？

How to extend knowledge building to include cross-community interaction, over time?

Yuan, G., & Zhang, J. (2019). Connecting Knowledge Spaces: Enabling Cross-Community Knowledge Building through Boundary Objects. *British Journal of Educational Technology, 50* (5), 2144–2161.

3. 总结与启示

- 循证研究不仅需要数据分析，而是综合、深入探究
  - 从实践问题到理论分析、到现场研究和数据分析、再回到理论和实践的提升
- 每个具体研究的严谨和深入：两个核心逻辑和质量标杆
  - 清晰透明的探究逻辑
    A clear and transparent logic of inquiry
  - 信实的论证逻辑
    A persuasive logic of argument to warrant claims
- **长期的系列研究体系**
  - 持续、多阶段的研究，理论-实证交互推进

A "pipeline" of evidence

不是研究程序而是精神：

有根基的知识创新和实践创新

启示

- 每个研究者？
- 下一代研究者的训练？
- 研究团队？
- 相应的研究环境和社会基础设施？（e.g. 伦理审核制度、数据库、审稿、研究投资）
- 提高研究在教育决策中的角色？

Real science is not about certainty, but about uncertainty.

Frederick Erickson and Kris Gutierrez (2002), p.21

谢谢大家！

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