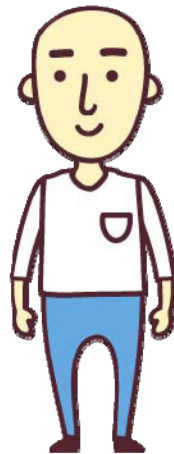




Peer Assessment Tools: peerScholar

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Advanced Learning Technologies Lab
University of Toronto Scarborough





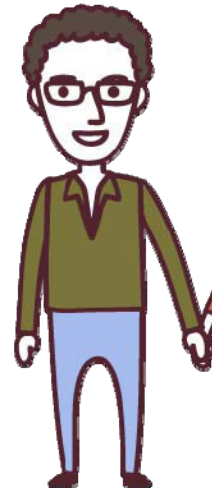
Tim Cho-Kin
Cheng



Lisa-Marie
Collimore



Rob
Walker



Steve & Sue
Joordens



Dwayne
Paré



ADVANCED
LEARNING
TECHNOLOGIES

Find stuff that works, then build technology around it



An online multiple-choice like tool that assesses learning in a manner that reinforces factual knowledge while simultaneously correcting misconceptions before they become entrenched



An active learning assessment that allows students to form and test hypotheses, replicate the tests done by classmates, and provide theoretical explanations for interesting or unexpected findings, all in the context of data they themselves provide.



A powerful, easy to use platform that exercises (and can assess) critical, creative and self-reflective thought and both expressive and receptive communication in even very large class contexts.



Research Support



Partners



Awards

- National Technology Innovation Award
- 3M National Teaching Fellowship
- Inventors of the Year Award (University of Toronto)
- City of Toronto Excellence Award
- MITACS Commercialization award
- Society for Teaching and Learning in Higher Education Award
- President's Teaching Award
- Principal's Special Commendation for Innovation in Teaching

+ Many More

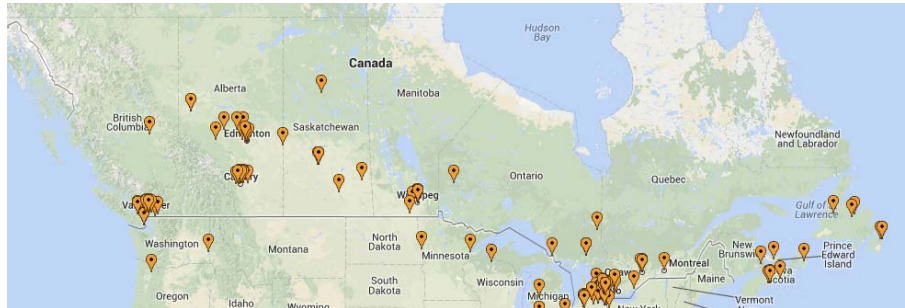
Research & Efficacy

Selected Publications:

- ✓ Paré, Dwayne E., Velji, Aly, Joordens, Steve, & Collimore, Lisa-Marie (Submitted) Defining and quantitatively measuring critical thinking skills in terms of quality discrimination: Implications for research and application. *Journal of the Learning Sciences*.
- ✓ Paré, Dwayne E., Collimore Lisa-Marie, and Joordens, Steve. (in press). Put Students' Minds Together and their Hearts Will Follow: Building a Sense of Community in Large-Sized Classes via Peer- and Self-Assessment. Toronto: *Higher Education Quality Council of Ontario*.
- ✓ Collimore Lisa-Marie, Paré, Dwayne E., Joordens, Steve. (in press). The SWDYT: So What Do You Think? Canadian Students' Attitudes about peerScholar, an online Peer-Assessment Tool. *Learning Environments Research*.
- ✓ Joordens, Steve, Paré, Dwayne E., & Collimore, Lisa-Marie. (2014). Taking Learning Outcomes to the Gym: An Assignment-Based Approach to Developing and Assessing Learning Outcomes. Toronto: *Higher Education Quality Council of Ontario*.
- ✓ Cheng, Cho Kin, Paré, Dwayne E., Collimore, Lisa-Marie, & Joordens, Steve. (2011) Assessing the effectiveness of a voluntary online discussion forum on improving students' course performance. *Computers & Education*, 56, 253-261.
- ✓ Paré, Dwayne E., & Joordens, Steve. (2009) The Invisible Researcher: Using Educational Technologies as Research Tools for Education. *The Journal on Systemics, Cybernetics and Informatics (JSCI)*, 5(7).
- ✓ Joordens, Steve, Desa, Shakinaz, & Paré, Dwayne E. (2009) The Pedagogical Anatomy of Peer-Assessment: Dissecting a peerScholar Assignment. *The Journal on Systemics, Cybernetics and Informatics (JSCI)*, 5(7).
- ✓ Joordens, Steve, Paré, Dwayne E., & Pruesse, Ky. (2009) peerScholar: An Evidence-Based Online Peer-Assessment Tool Supporting Critical Thinking and Clear Communication. *Proceedings of the 4th International Conference on e-Learning*, 236-240.
- ✓ Paré, Dwayne E., & Joordens, Steve. (2008) Peering into Large Lectures: Examining Peer and Expert Mark Agreement Using peerScholar, an Online Peer Assessment Tool. *Journal of Computer Assisted Learning*, 24(6), 526-540.

peerScholar.®

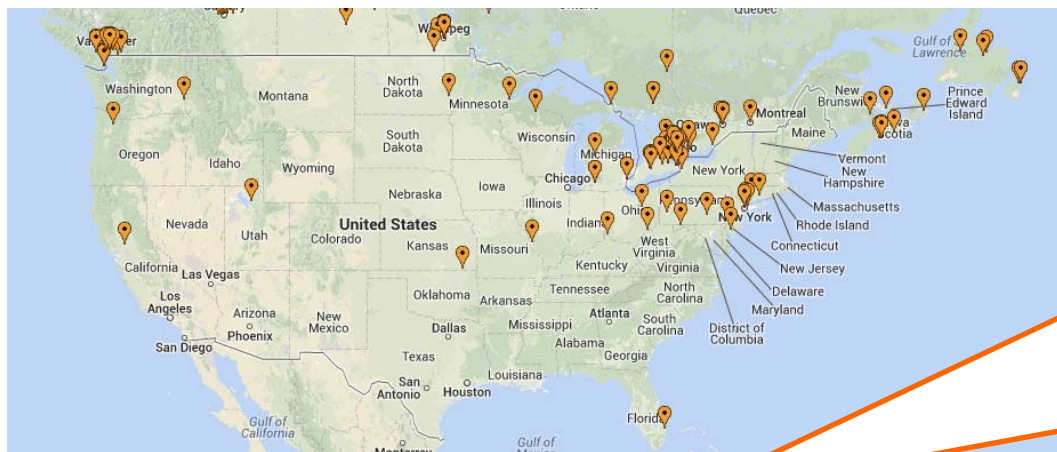
peerScholar Usage



CANADA: 163 Institutions



INTERNATIONAL: 33 Institutions



USA: 25 Institutions

- | | |
|------------------------------|--|
| New York University | Washington University in St. Louis |
| BPC school | West Linn High School |
| St. Mary's School | The American College of Financial Services |
| WAYNE STATE UNIVERSITY | UNIV OF CALIF - DAVIS |
| CUMBERLAND COUNTY COLLEGE | FERRIS STATE UNIVERSITY |
| NORTH DAKOTA ST UNIVERSITY | MARIETTA COLLEGE |
| NYU SCHOOL OF EDUCATION | WESTERN CONN STATE UNIV |
| Southeastern College | OHIO STATE U AGR/TECH INS |
| FROSTBURG STATE UNIVERSITY | CENTRAL PA COLLEGE |
| UNIV OF WISCONSIN - SUPERIOR | ST JOHNS RIVER STATE COLLEGE - ORG PARK CAMPUS |
| WASHINGTON STATE UNIVERSITY | |
| CARNEGIE MELLON UNIVERSITY | |
| SUNY AT BUFFALO | |

Learning Outcomes



2 CRITICAL AND CREATIVE THINKING*

SUBCOMPETENCY		TWO-YEAR DIPLOMA	THREE-YEAR DIPLOMA	BACHELOR'S DEGREE	MASTER'S DEGREE
2.1	Critical Thinking	Identify and compare assumptions and arguments	Evaluate assumptions and arguments, and defend a standpoint	Evaluate underlying assumptions and arguments; develop and support a standpoint	Evaluate underlying assumptions and arguments in own work relative to your field; develop and support a standpoint
2.2	Creativity	Adapt existing ideas or techniques to respond to a specific issue	Adapt existing ideas or techniques to respond to a specific issue	Devise innovative approaches which may build on existing ideas or techniques	Devise innovative approaches which may build on existing ideas or techniques and discuss the implications for the field
2.3	Problem Identification	Identify and define a problem	Identify and define a problem	Identify and define a problem and the associated constraints and objectives	Identify and define a complex problem and the associated constraints and objectives
2.4	Problem Solving	Compare a prescribed set of solutions to a problem; choose and implement the most suitable approach	Evaluate possible solutions to a problem; adapt and implement the most suitable approach	Independently evaluate possible solutions to a problem; develop and implement a suitable approach	Independently evaluate a comprehensive range of possible solutions to a complex problem; develop and implement a suitable approach
2.5	Analysis of Risks and Benefits	Mitigate possible risks associated with solving a problem using prescribed methods	Anticipate and mitigate potential risks associated with a problem using prescribed methods	Compare and contrast the risks and benefits of different strategies for responding to various problems	Evaluate risks and benefits of different strategies, including broader implications of available options
2.6	Evaluation	Assess the quality of results and draws conclusions	Assess the relevance and reasonableness of assumptions and quality of results, draw conclusions and recommend directions for future work	Assess the relevance, reasonableness and effectiveness of assumptions, methods and quality of results, draw conclusions and recommend directions for future work	Assess the relevance, reasonableness and effectiveness of assumptions, methods and quality of results; draw conclusions and recommend directions for future work

**Core Competencies
Transferable Skills
Learning Primitives?**

Critical Thinking

Analyze, Compare, Evaluate, Question,
Differentiate, Categorize

Creative Thinking

Build, Modify, Solve, Improve

**Communication
(Expressive / Receptive)**

Structure, Clarity, Efficiency, Impact

Collaboration

Social Interactions, Cooperation, Respect

Content

MetaCognition

Self-Analysis, Identification of Weakness,
Strategies for Change

Benefits of Peer (and Self) Assessment



Provides palpable and personal feedback that is critical to the development of self-reflection and metacognition



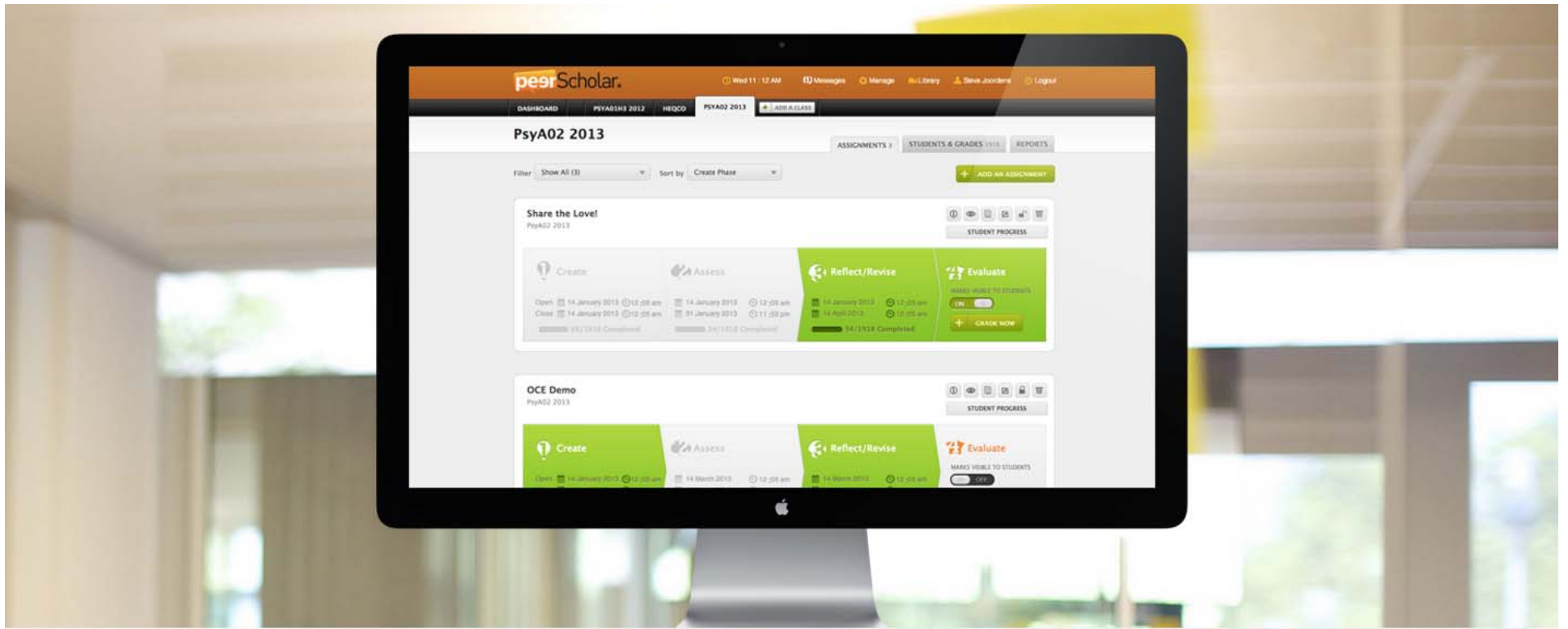
Provides structured practice with critical thought, creative thought and clear efficient communication



When quality of feedback is emphasized it gives students structured practice both in terms of providing effective feedback in addition to practice in receptive communication



When all of this is combined with content relevant assignments, it marries the learning of knowledge and cognitive skills in a way that highlights the importance of working with knowledge, rather than simply possessing it





peerScholar. Fri 1:40 PM Messages Demo Student Logout

DASHBOARD GRADE 9 ENGLISH HISTORY VISUAL ARTS MUSIC SOCIAL SCIENCE JOIN A CLASS

Cellphones and Learning — Opinion Piece instructor Demo Teacher << Back to Grade 9 English

Create Instructions & Tips Create Self-Assess 100% Complete

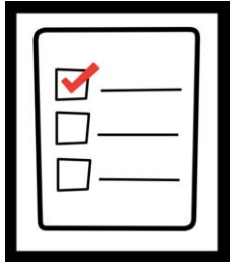
word count: 454 words ASSIGNMENT RUBRIC GRAPHIC ORGANIZER

Do cellphones help or hurt student learning? Maybe!

Do cellphones help or hurt student learning? I think the answer to this is clear, and the answer is ... it depends! Like almost everything in life, some new technology is just that, a new technology. Whether it is good or bad with respect to some other thing depends on how that technology is used. This is the point I will argue in this essay, hopefully quite persuasively.

First I'd like to talk about another technology that was likely a big part of your life when you were young. That technology is television. Did television help or hurt your learning? Well, I expect that some kids only ever watched junk television. They watched shows about nothing, maybe just music videos or silly comedies that didn't include educational information. But other kids might have watched documentaries, or nature shows, or even Sesame Street. The television probably hurt the first group of students, but helped the second group.

peerScholar.



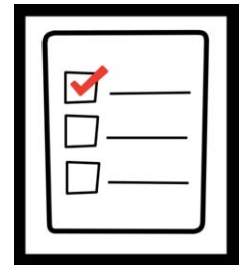
Learning Objectives

?



A screenshot of the peerScholar website interface. The top navigation bar is orange and contains the peerScholar logo, the date and time (Fri 1:40 PM), and user options (Messages, Demo Student, Logout). Below this is a secondary navigation bar with tabs for DASHBOARD, GRADE 9 ENGLISH, HISTORY, VISUAL ARTS, MUSIC, SOCIAL SCIENCE, and JOIN A CLASS. The main content area is titled "Cellphones and Learning — Opinion Piece" by Instructor Demo Teacher, with a link to "<< Back to Grade 9 English". A progress bar shows "100% Complete" with steps for "Assess", "Instructions & Tips", "Give Feedback (3/3)", and "Self-Assess". Below the progress bar are buttons for "ASSIGNMENT", "RUBRIC", and "GRAPHIC ORGANIZER". There are also tabs for "Peer 1", "Peer 2", "Peer 3", and "My Assignment". The main content area displays an assignment by Peer 1 titled "Cellphones are Beneficial to Student Learning" with a text block and a comment box containing the text "Nice and simple title" and an "Edit" button.

peerScholar.



Learning Objectives

- Critical Thought
- Creative Thought
- Communication
- Collaboration
- metaCognition



peerScholar. Fri 1 : 40 PM Messages Demo Student Log

DASHBOARD GRADE 9 ENGLISH HISTORY VISUAL ARTS MUSIC SOCIAL SCIENCE JOIN A CLASS

Cellphones and Learning — Opinion Piece

 Instructor Demo Teacher << Back to Grade 9 English

Reflect/Revise

- Instructions & Tips
- Review Feedback (3/3)**
- Revise
- Reflect
- Self-Assess

100% Complete

e Peer 1

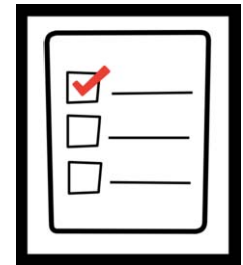
Give at least one positive comment about your peer's assignment.
I really liked that TV comparison. It made your argument sound clear and hard to argue against. Got me thinking.

Give at least one constructive comment to help your peer improve the assignment.
Your main point is clear and strong but sometimes it got a little hidden by other things you were saying. I think you could say less while actually producing a better argument.

Rating
★ ★ ★ ☆
3 Out Of 4 Stars

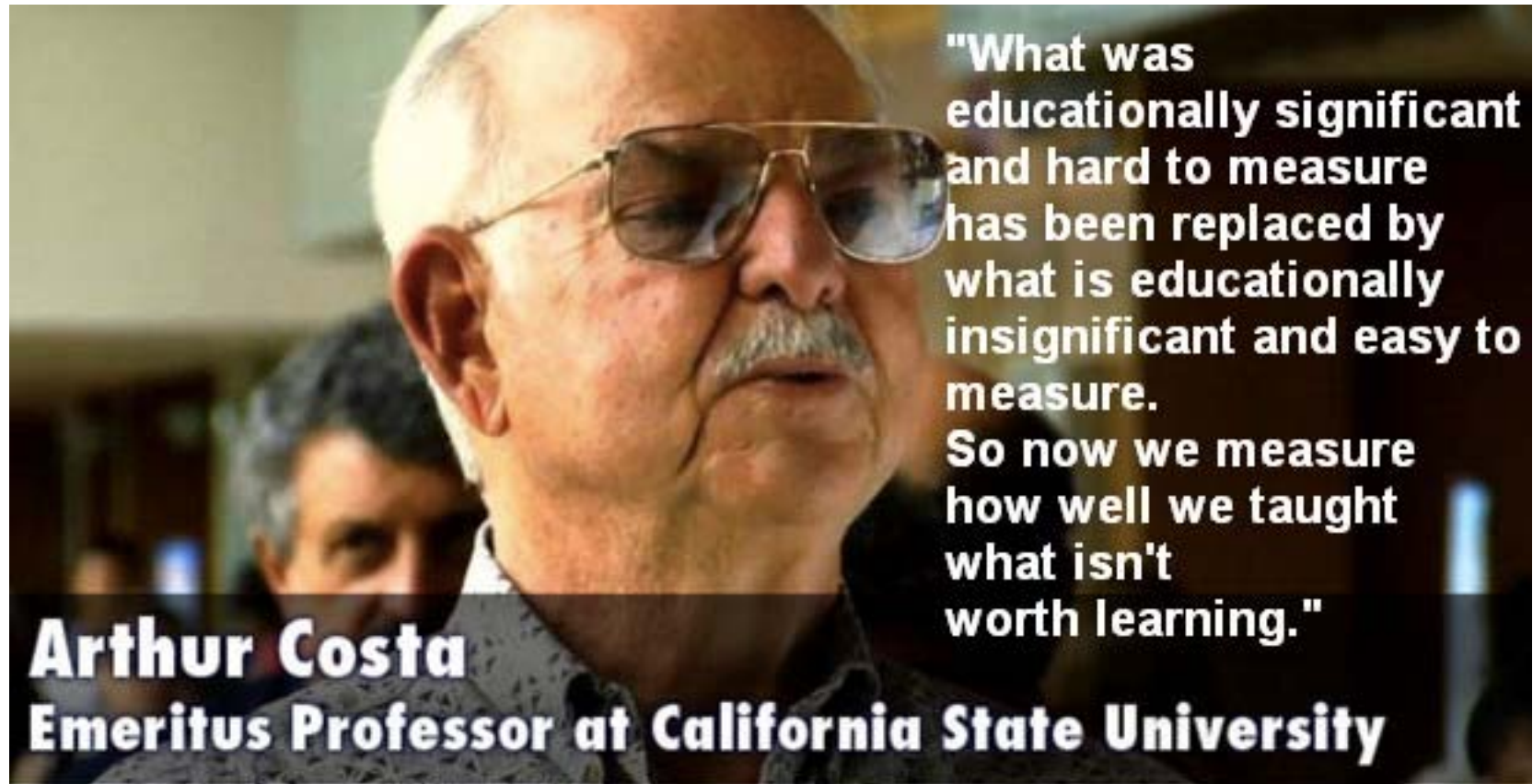
How useful is this feedback?
Useful

peerScholar.



Learning Objectives

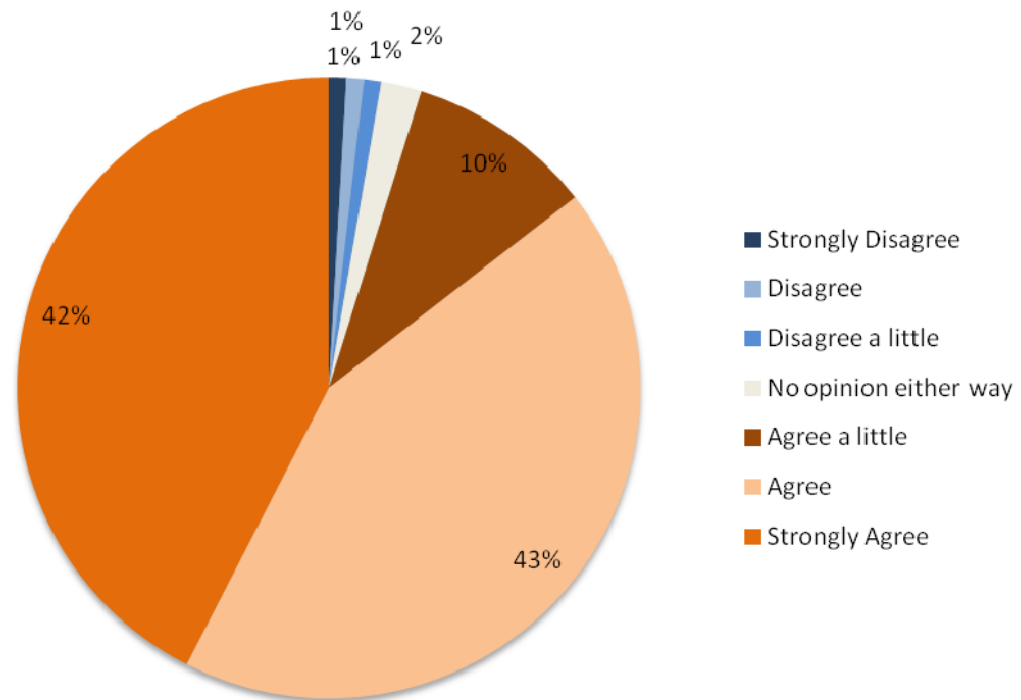
- Communication
- Critical Thought
- Creative Thought
- metaCognition



"What was educationally significant and hard to measure has been replaced by what is educationally insignificant and easy to measure. So now we measure how well we taught what isn't worth learning."

Arthur Costa
Emeritus Professor at California State University

While assessing the work of my peers, I thought about the quality of my own work.



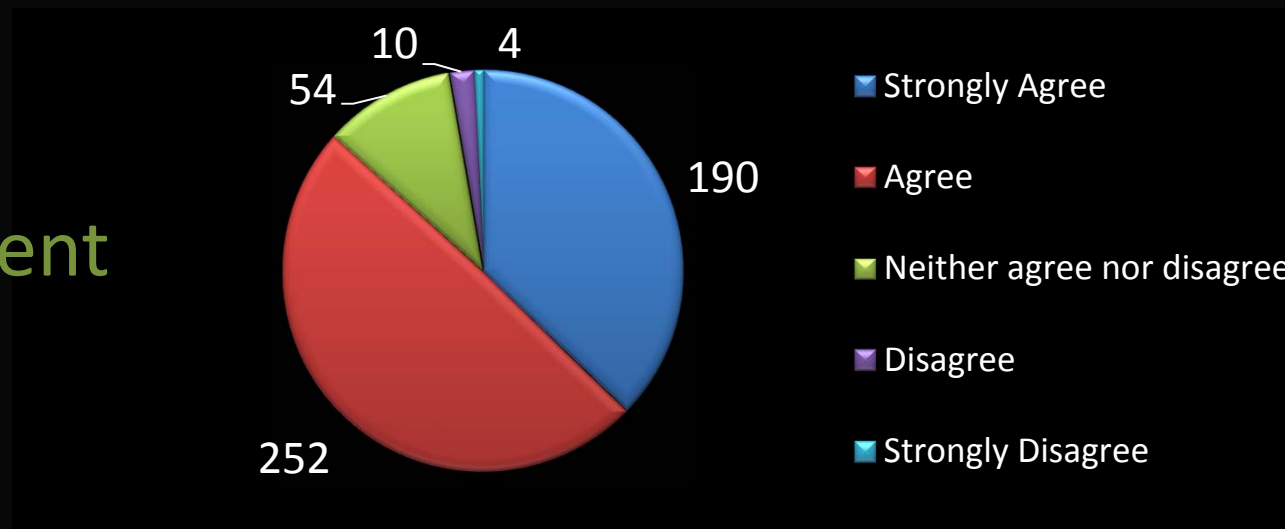
Content

Surveys and Questionnaires



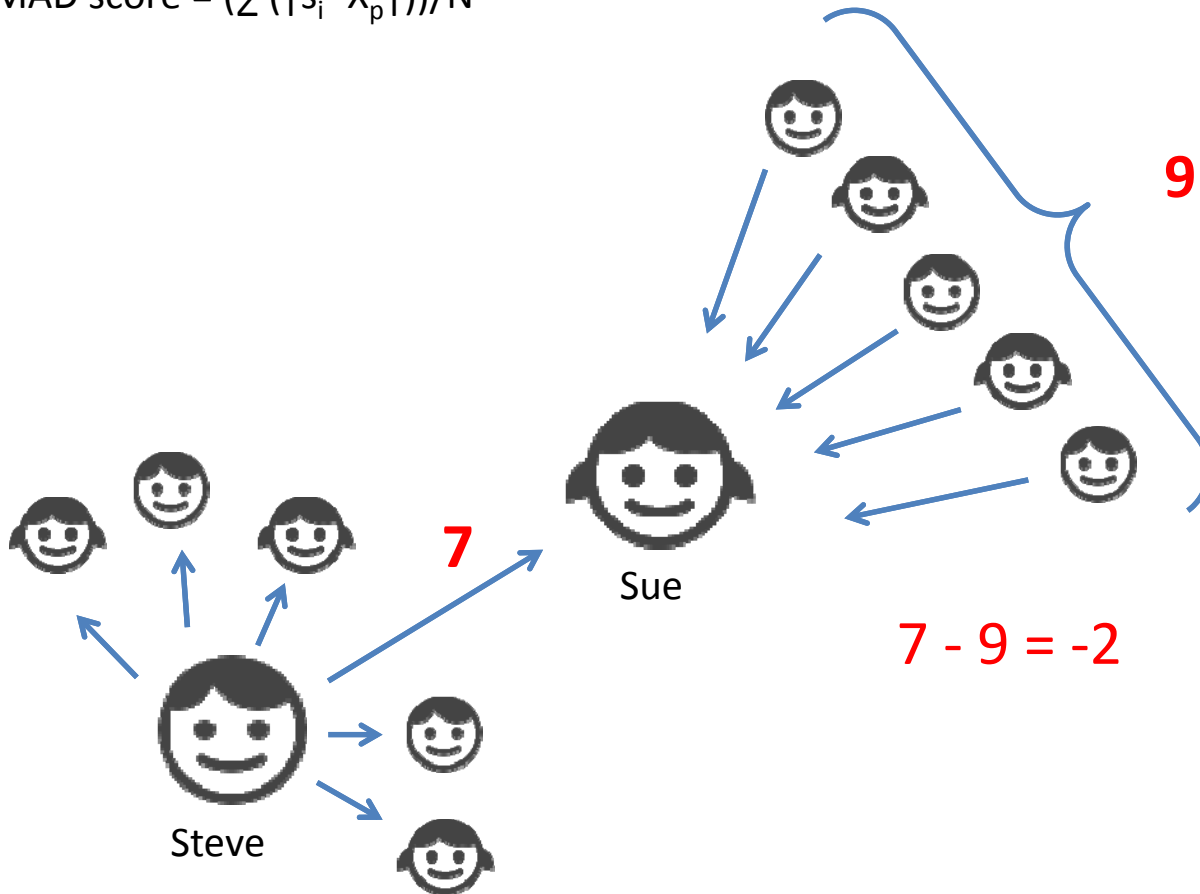
Student attitudes on the benefits of using pS in the Intro Psych Course to learn course material:

Content



Critical Thinking

$$\text{MAD score} = (\sum (|s_i - \hat{X}_p|))/N$$



$$7 - 9 = -2$$

$$3 - 3 = 0$$

$$6 - 6 = 0$$

$$8 - 9 = -1$$

$$9 - 6 = 3$$

$$4 - 9 = -5$$

$$(2 + 0 + 0 + 1 + 3 + 5)/6$$

$$= 1.83$$

peerScholar is an evidence-based online peer & self-assessment tool. Our research has shown that use of peerScholar can enhance students' ...

Critical Thinking Skills

Students significantly improved in their ability to rate the quality of peers' work across three peerScholar assignments. This is likely due to the peer assessment process and not the content of the assignment as the two groups (peer assessment & no peer assessment) were not different at Time 1 and Time 3.

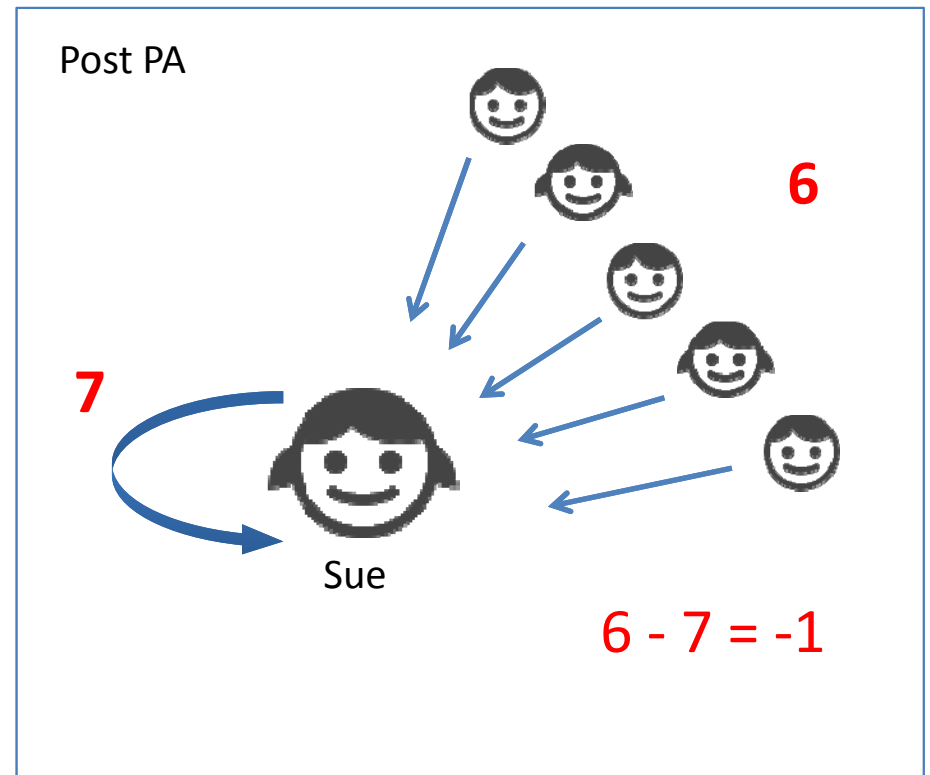
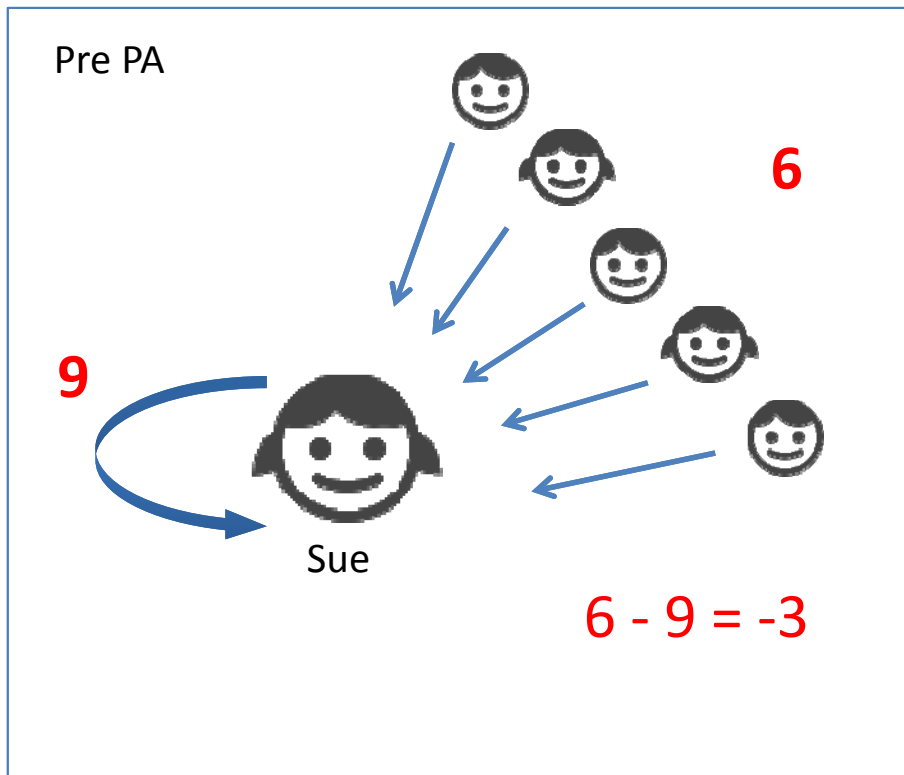


■ No Peer Assessment

■ Peer Assessment

Meta Cognition

$$\text{mC score} = [\text{SAs (prePA)} - \text{As}] / [\text{SAs (postPA)} - \text{As}]$$



Meta Cognition

Students were significantly more accurate at rating the quality of their own work (i.e. closer to their actual grade) after rating the work of their peers.

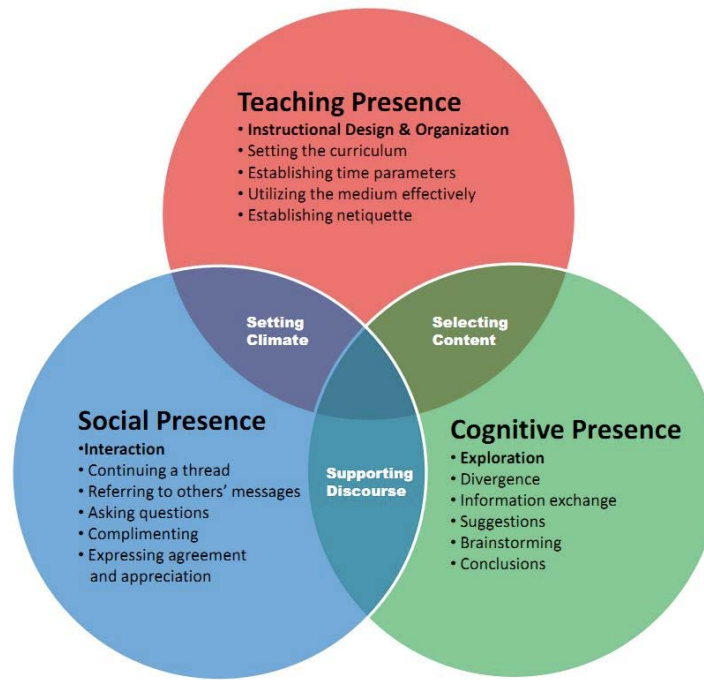


■ No Peer Assessment

■ Peer Assessment

Community

Community of Inquiry (CoI)



Community of Inquiry

Sense of Community

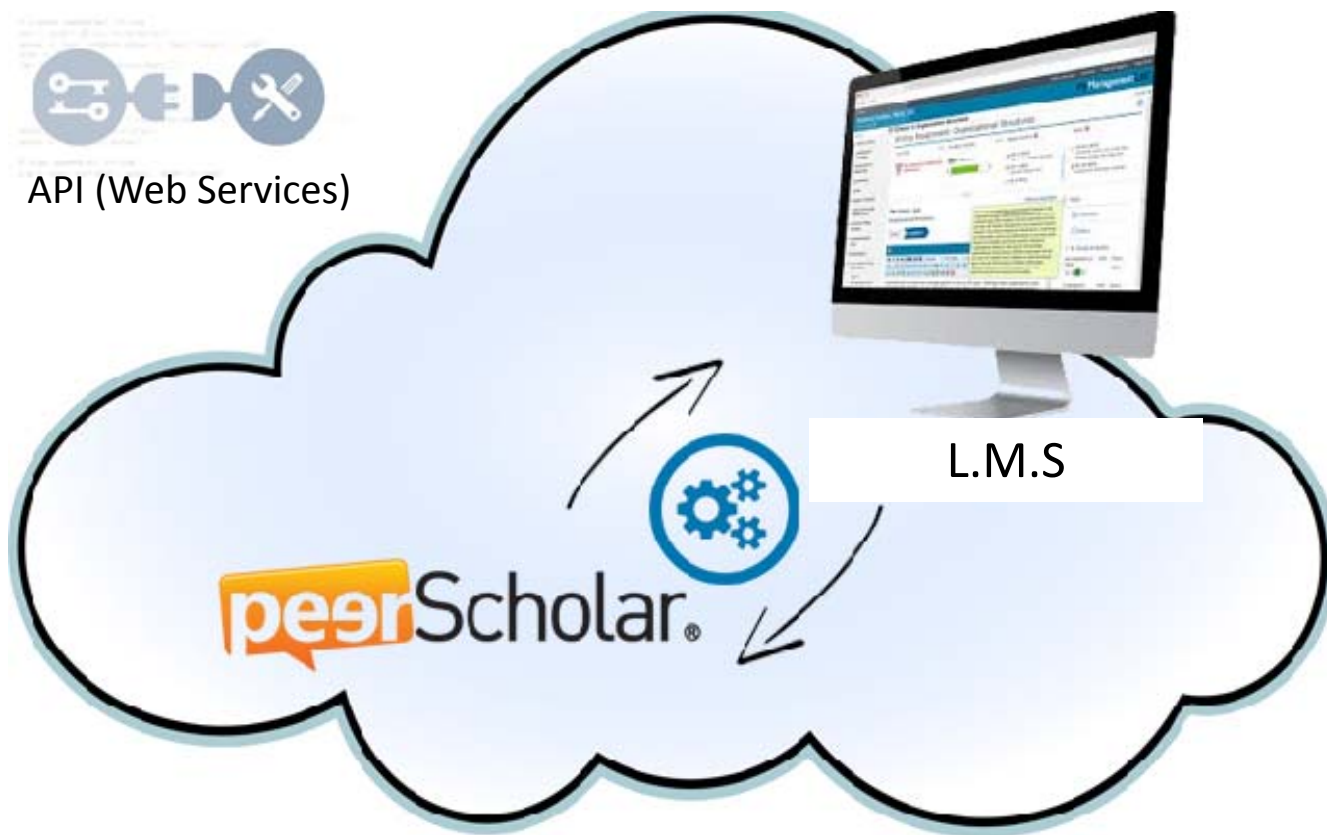
Students who used peerScholar to participate in a peer assessment assignment were significantly more likely to say they felt more group cohesion on the Community of Inquiry survey.



■ No Peer Assessment

■ Peer Assessment

The Relationship Between peerScholar and Learning Management Systems



In an automated way:



Grades for compositions provided by average peer rating (Paré & Joordens, 2008)



Grades for “quality of feedback” provided by average peer rating for quality of feedback



Or, students can submit a revision and the teacher grade based on their own combination of expert and peer feedback



www.peerScholar.com



[@peerScholar](https://twitter.com/peerScholar)



www.facebook.com/peerScholar