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Improving learning by building on pupils' natural capacity to generate inner feedback

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INSPIRING
PEOPLE

Feedback: a troublesome issue

Student satisfaction

Teacher workload (large class sizes)

Students often don't appear to learn from feedback

Feedback at end – no opportunity to use it

Tension between feedback as telling versus students developing as independent and self-regulating learners.

Some solutions to feedback dilemma

Increase quality of comments	More detail Corrective advice Forward looking Specific improvement points Better framing in terms of criteria and rubrics
More efficiencies in feedback	Sharing learning intentions beforehand Turn-around times for receipt Whole-class feedback Audio and video feedback Computerized/automated feedback
Greater student engagement with and agency in feedback (e.g. notions of 'feedback recipience' & 'feedback literacy')	Feedback requests Draft-feedback-redraft More opportunities for student-teacher dialogue Opportunities to act on feedback Peer feedback

Yet the problem persists

- ❑ Thousands of published articles each year on how to improve feedback.
- ❑ Most start by saying how powerful feedback is for learning then say potential not being realised!
- ❑ Many funded projects
- ❑ Universities now appointing Professors of Educational Assessment and Feedback
- ❑ Research centres around the world set up with assessment and feedback focus

- ❑ Why have we not solved this problem?

Problem is in how feedback is conceptualised

When we think of "Feedback"

"Comments" "Information" "Corrections"
"It's on the assessment"
"Delivered by tutors, or peers"
"Received by the student"
"Comes after submission of assessment task"
"Students will use the feedback"
"Feedback will feedforward to next assignment"
"Students will remember the feedback"
"Students will link feedback to previous feedback"

What is inner feedback?

Definition

Inner feedback is the new knowledge that students generate when they compare their current knowledge and competence against some reference information guided by their goals.

I and colleagues have been researching what happens if students deliberately compare their developing work against information from sources other than comments (online or offline)? e.g. in rubrics, exemplars, videos, textbooks, lectures, blogs, wikis, discussion fora, question lists, journal articles, the performances and work of others etc.

Findings: feedback that students generate from other information sources is more varied than, complements and under the right circumstances can surpass the feedback that teachers provide as comments.

Students are generating feedback all the time

[planned comparisons]

[natural comparisons]

Students DO some work

↓

Teacher Comments ← **COMPARE**

↓

Generate INNER FEEDBACK

↓

New understanding Performance improvements

Learning outcomes

Discussions with others

Peer comments

Rubrics

Criteria

Task Instructions

Peer works

Lecture Presentations

Journal articles

Textbook explanations

Exemplars

Videos

Reports

Models

Diagrams

Questions lists/ principles

Blogs, wikis, forums

Mathematical formulae

Observations of others

If it is that simple why has no-one thought of this before?

❑ Comparison has never before been identified as core mechanism underpinning internal feedback generation

❑ Feedback comparisons happening all the time –ongoing, cyclic, pervasive - musicians, scientists, everyone, students

❑ Artificial separation of natural and formal feedback process (i.e. as comments)

❑ Not appreciated is power to be gained by harnessing natural feedback processes – for learning and learner self-regulation

Unlocking the Power of Inner feedback

Students DO some work

↓

COMPARE

↓

Writing ←

Discussion ←

MAKE INNER FEEDBACK EXPLICIT

→ Actions

→ Interactions

↓

New understanding. Performance improvements
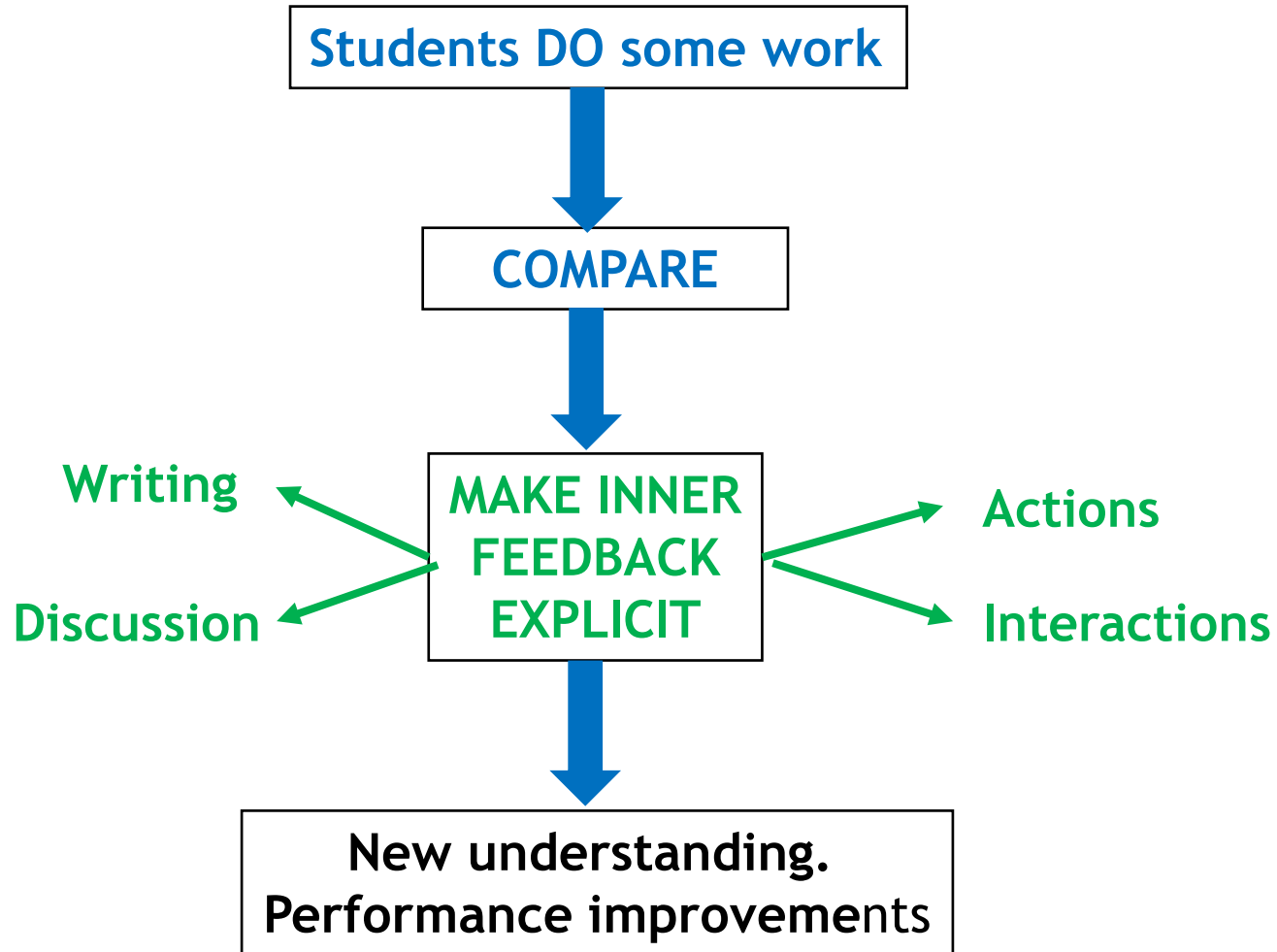
Why is EXPLICITNESS important?

❑ Increases the power of inner feedback

❑ For students – see own feedback capability – makes own agency visible - raises metacognitive awareness ––- promotes transfer of learning to new contexts

❑ For teachers – better diagnostic information about students learning, what comments they need, and what comparisons to stage next - reduces workload
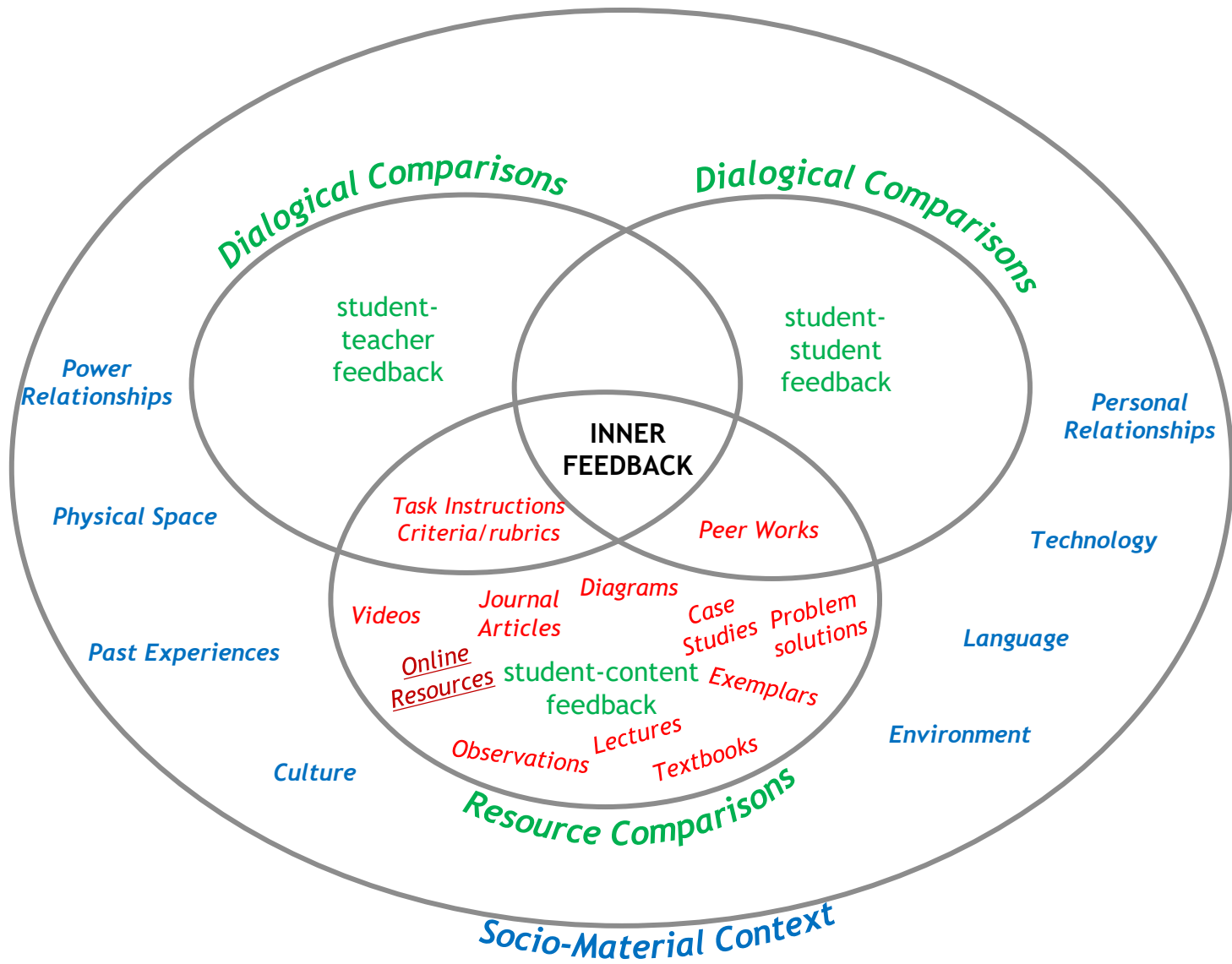
Three types of feedback comparisons: teacher-student, student-student and student-resource

I am NOT here making an argument against comments or dialogue as feedback

I am making a case for balancing all three types of feedback comparisons in ways that:

❑ decentre teacher feedback as telling and still scaffold and support learning and the development of self-regulation by students.

❑ increase feedback opportunities at scale without a corresponding increase in teacher workload.
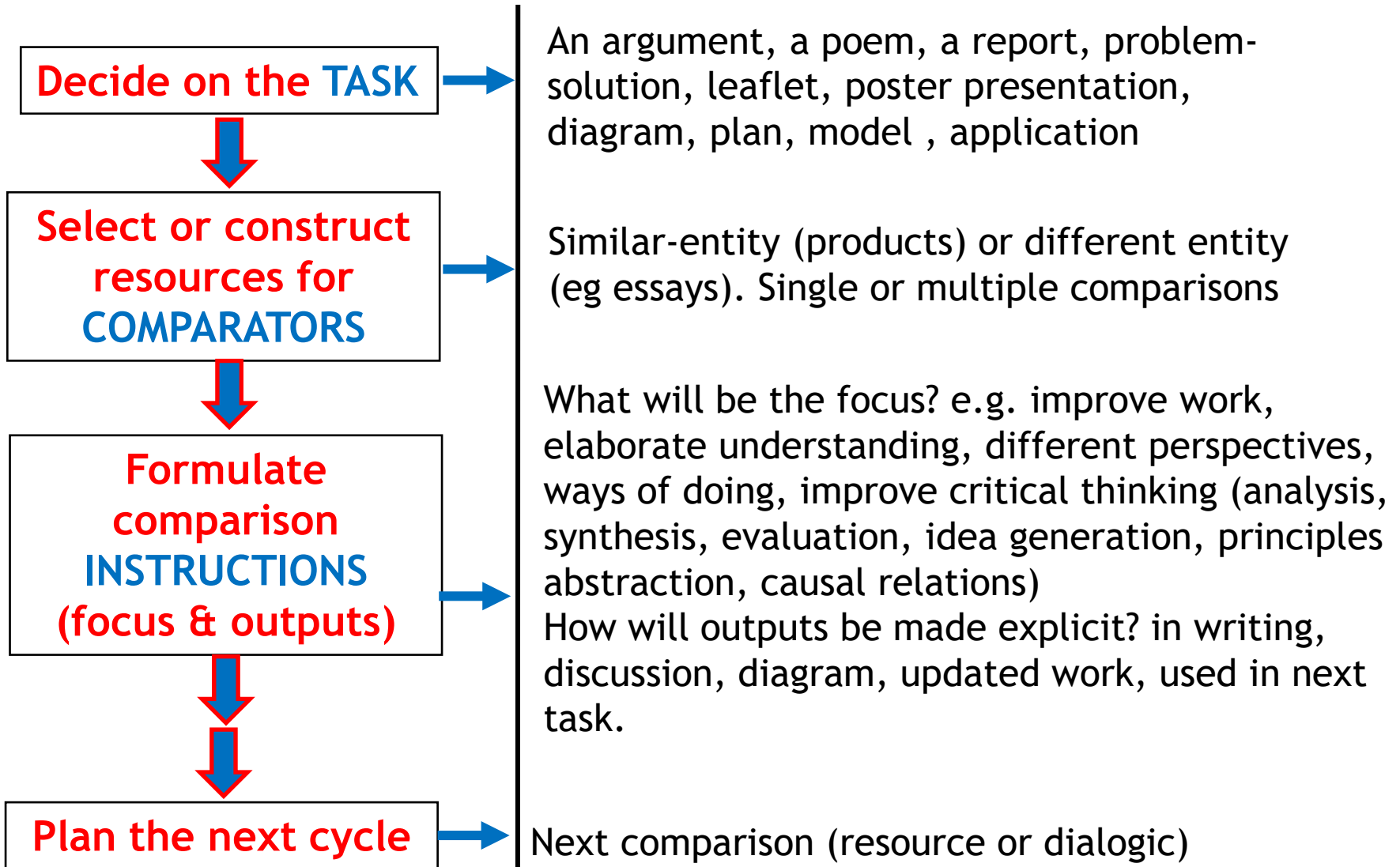
What do you think are the merits or drawbacks of student-content (resource) feedback comparisons over dialogical comparisons (i.e. student-teacher and student-peer)?

Post response in the chat and any other questions or comments.

Teacher

In practice

[Expected learning outcomes]

| **Decide on the TASK** | An argument, a poem, a report, problem-solution, leaflet, poster presentation, diagram, plan, model , application |

| **Select or construct resources for COMPARATORS** | Similar-entity (products) or different entity (eg essays). Single or multiple comparisons |

| **Formulate comparison INSTRUCTIONS (focus & outputs)** | What will be the focus? e.g. improve work, elaborate understanding, different perspectives, ways of doing, improve critical thinking (analysis, synthesis, evaluation, idea generation, principles abstraction, causal relations) How will outputs be made explicit? in writing, discussion, diagram, updated work, used in next task. |

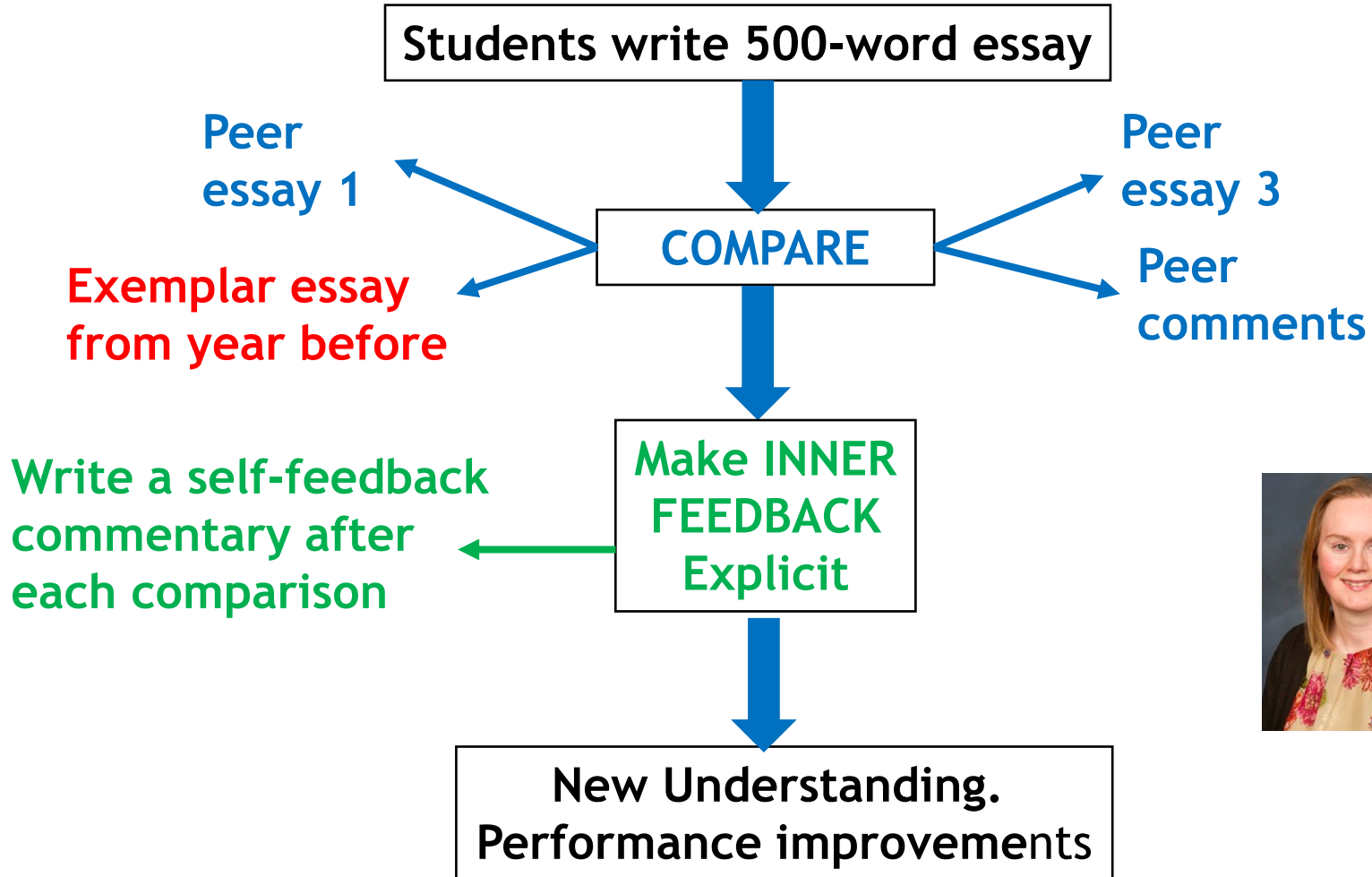| **Plan the next cycle** | Next comparison (resource or dialogic) |

Example 1: Peer comparisons

❑ For me the importance of comparison was highlighted by students in a peer review study

❑ Students learn as much, if not more, from comparing their work against their peer's work than from comparing their work against comments received.

Nicol, D., A. Thomson, and C. Breslin. 2014. "Rethinking Feedback Practices in Higher Education: A Peer Review Perspective." Assessment & Evaluation in Higher Education 39 (1): 102–122. doi:10.1080/02602938.2013.795518.

Financial Accounting 1 - 1st year, semester 1

Students write 500-word essay

Peer essay 1

Peer essay 3

COMPARE

Exemplar essay from year before

Peer comments

Make INNER FEEDBACK Explicit

Write a self-feedback commentary after each comparison

New Understanding. Performance improvements

Nicol, D., and S. McCallum. 2021. "Making Internal Feedback Explicit: Exploiting the multiple comparisons that occur during peer review". Assessment and Evaluation in Higher Education. Open access

Comparison questions

Essay 1 and High-Quality Essay
1. What are the two main differences between this essay and yours? Explain
2. What did you learn from these differences? Give a reason.
3. Overall which is better your essay or this one? Explain

Essay 3
1. What did you learn about your own essay from reviewing this essay?
2. Can you rank the essays including your own from best to least good? Give a reason for your ranking.
3. From reviewing all three essays, name two things you would do to improve your own essay

Received comments
1. What did you learn about your own essay from reading the reviews from peers?
2. Have you identified any additional changes you would make to your essay? If yes, give details.

SELF-REVIEW 2 (against inserted higher-quality essay).

Question 1: differences between this essay and yours
This essay is structured very well in comparison to mine.
Problems are broken into three paragraphs and an argument is made then something is used to back it up whereas, looking at it now, my arguments seem like more of a list. The introduction is also much more effective than mine.

Question 2: learning from differences
I now realise I need to structure my arguments more effectively and reference when appropriate. I also know I need to give more information in my introductions that give the reader a better idea of what the essay is about.

Question 3: Which essays is better and why?
Overall, this essay is better than mine. it uses references more effectively, a decent conclusion is included, the introduction has more content and arguments are laid out in a better way.

Students' vs teacher feedback

Essay grade (student numbers)	Self-review stage at which teacher feedback comments and student's feedback commentary matched				Incomplete Match with teacher comments
	Match at Self-review 1 (essay 1)	Match at Self-review 2 (essay 2)	Match at Self-review 3 (essay 3)	Match at Self-review 4 (received comments)	
A-grade (12)	2	4	3	2	1
B-grade (19)	2	6	4	5	2
C-grade (10)	3	2	1	3	1
Totals	**7**	**12**	**8**	**10**	**4**
Cumulative Totals (%)	**7 (17%)**	**19 (46%)**	**27 (66%)**	**37 (90%)**	**41 (100%)**

Table 1: Number of self-reviews (comparisons) required for students' feedback commentary to match teacher feedback comments.

It gets even better...

- Students exceeded teacher comments in several ways:

Criteria
- More detail
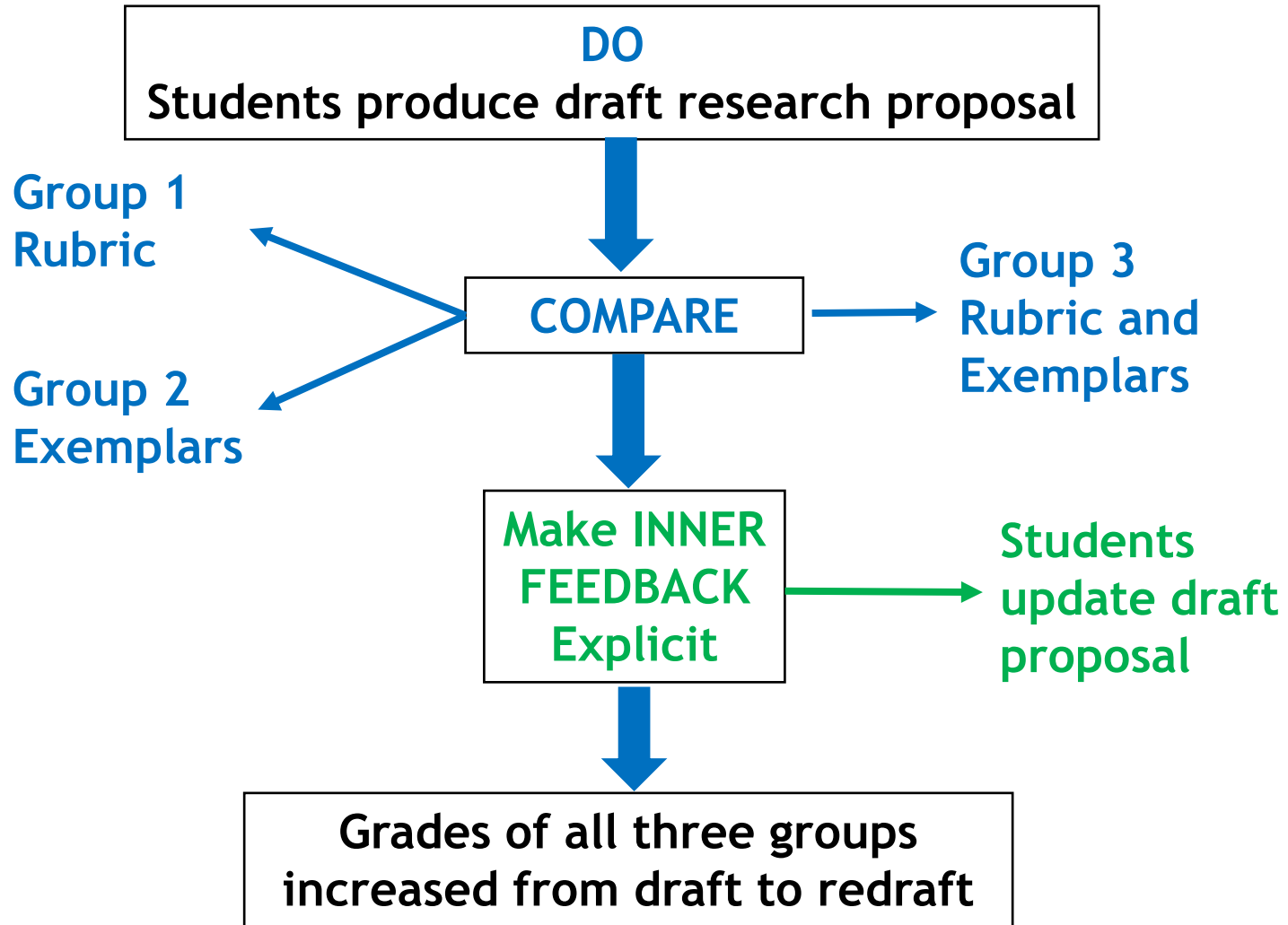- Additional issues
- Additional action points

Beyond Criteria
- Motivational
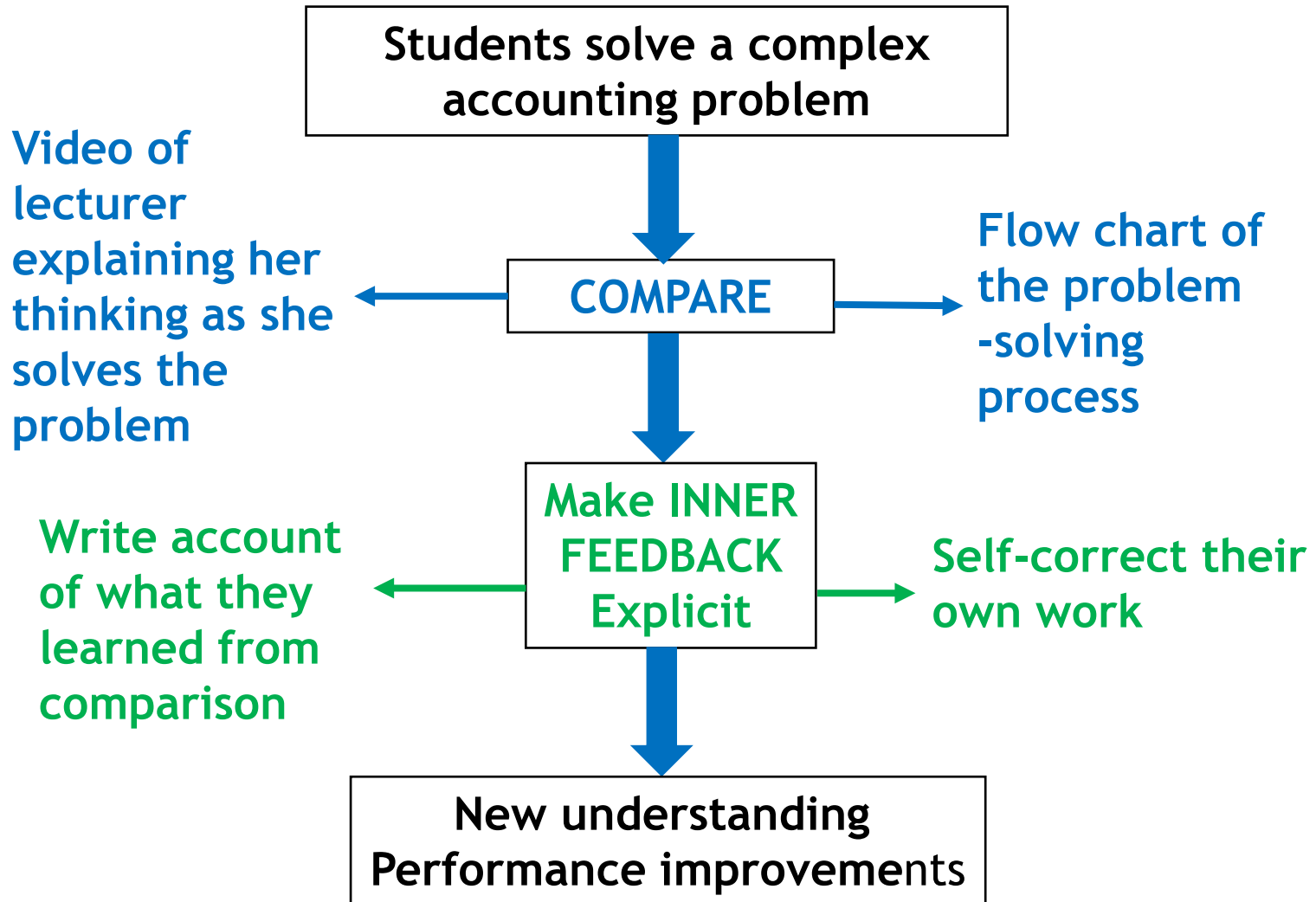- Reader perspective
- Alternative approach

Findings:

❑ Students can match and even exceed teacher feedback (at all ability levels)

❑ Multiple comparisons are key: feedback builds up over different comparisons (sequential) and multiple simultaneous comparisons generates feedback a teacher might have difficulty providing

❑ Students learn different things from high and low quality comparators

❑ Very few students added something new (or substantial) to their own feedback when comparing with peer comments (rather than peer works).

❑ Student quote "making comparisons forces you to engage and understand the material more than just getting told what to fix or amend"

Psychology 2nd year: Draft-redraft: Rubric & Exemplars

DO
Students produce draft research proposal

Group 1 Rubric

Group 2 Exemplars

COMPARE

Group 3 Rubric and Exemplars

Make INNER FEEDBACK Explicit

Students update draft proposal

Grades of all three groups increased from draft to redraft

Lipnevich et al (2014). Mind the gap! Students' use of exemplars and detailed rubrics as formative assessment. *Instructional Science*, 42(4), 539-559.

Accountancy and Finance 1ˢᵗ year

Students solve a complex accounting problem

Video of lecturer explaining her thinking as she solves the problem ← **COMPARE** → **Flow chart of the problem-solving process**

Write account of what they learned from comparison ← **Make INNER FEEDBACK Explicit** → **Self-correct their own work**

New understanding Performance improvements

[McCallum and Nicol 2021]

Comparison types

Feedback comparison is always a relationship between two (or more) products: one that student produces and the other the information they use for comparison. There are two broad categories:

❑ Similar entity comparisons: e.g. students produce a report and compare against other reports or solve a problem and compare against other problem solutions. Within this there are subdivision centering on whether the form or content of the entity is the same or different and to what extent.

❑ Different entity comparisons: e.g. students produce a report and compare it against something different, for example, information in a video, a list, a diagram, a textbook etc. There is no limit to the possibilities here but there is also no research on this.

❑ Multiple comparisons: simultaneous or sequential

Information in:
Textbook
Journal article
Video and/or audio file
Lecture presentation
Case study
Report or essay
Diagram (flow chart, mind map, graph, concept map)
Calculation or equation or problem solution
Newspaper/magazine articles
Poems, plays
Simulations

Task instructions
Learning outcomes
Rubric or assessment criteria
Comments supplied somebody

List of principles
List of questions

Think-aloud explanation
Blogs, wikis, discussion board posts
Narrative account
Observations
Simulations
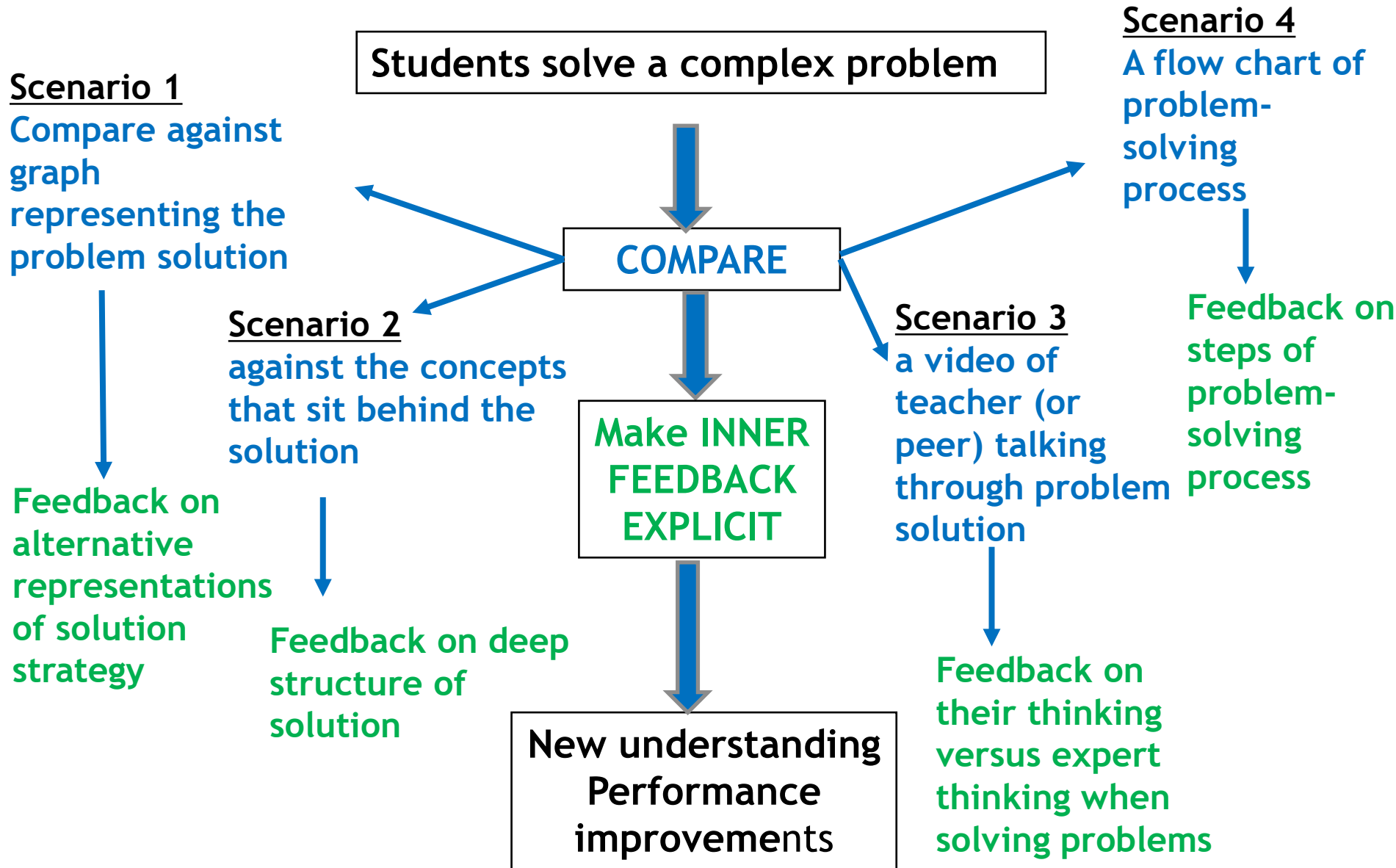Client requirements
Role play
Discussion
Artefacts (e.g. radiographs, models)

Students produced artefacts (e.g. lecture notes, prior work, discussion posts)

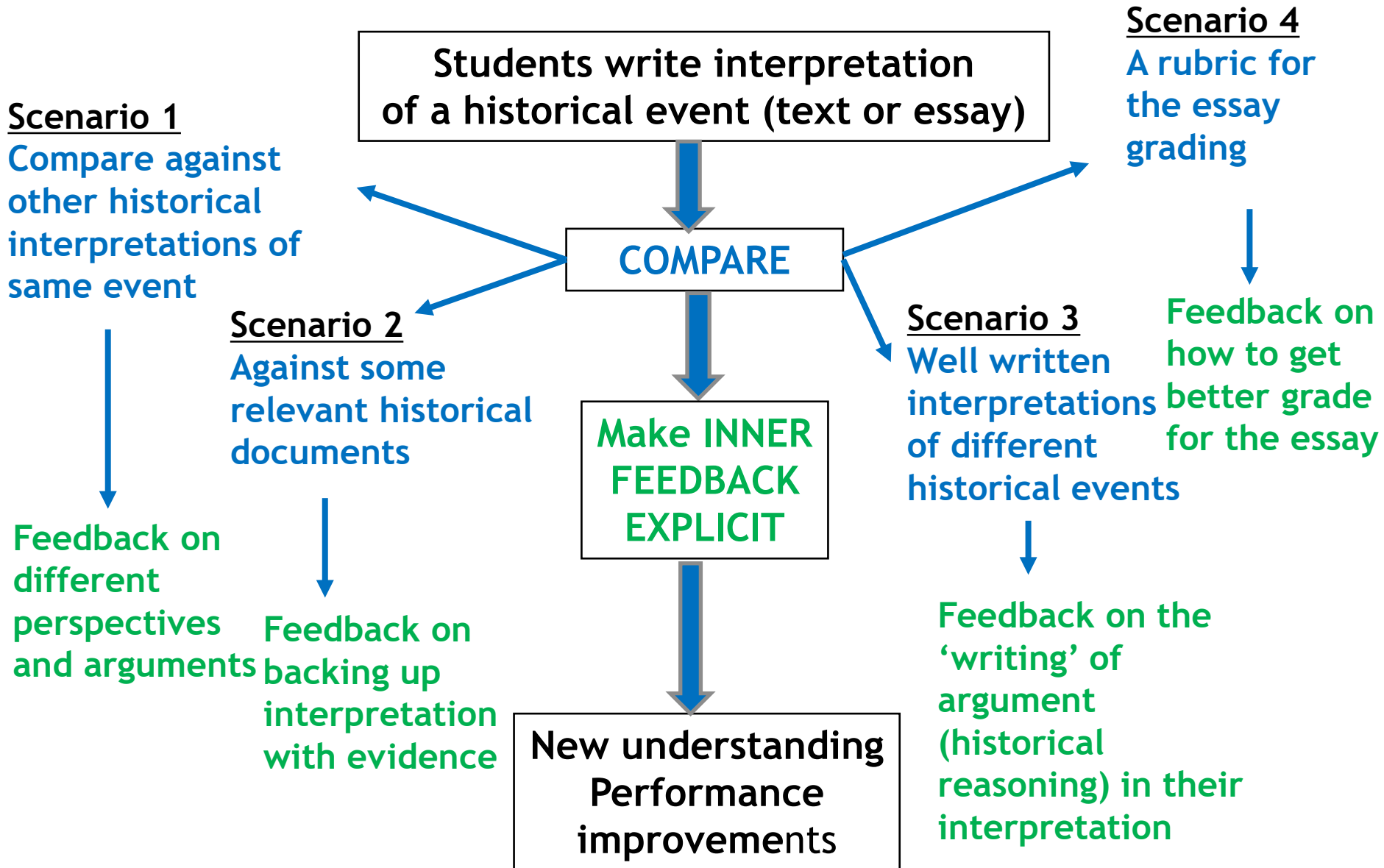Website resources (could cover any of the above including interactive resources)

Comparison Resources

Mathematics

Students solve a complex problem

Scenario 1
Compare against graph representing the problem solution

→ Feedback on alternative representations of solution strategy

Scenario 2
against the concepts that sit behind the solution

→ Feedback on deep structure of solution

COMPARE

Make INNER FEEDBACK EXPLICIT

New understanding Performance improvements

Scenario 3
a video of teacher (or peer) talking through problem solution

→ Feedback on their thinking versus expert thinking when solving problems

Scenario 4
A flow chart of problem-solving process

→ Feedback on steps of problem-solving process

Different comparators result in different kinds of inner feedback *What an item is compared against, changes what is learned*

History

Students write interpretation of a historical event (text or essay)

Scenario 1
Compare against other historical interpretations of same event

Feedback on different perspectives and arguments

Scenario 2
Against some relevant historical documents

Feedback on backing up interpretation with evidence

COMPARE

Make INNER FEEDBACK EXPLICIT

New understanding Performance improvements

Scenario 3
Well written interpretations of different historical events

Feedback on the 'writing' of argument (historical reasoning) in their interpretation

Scenario 4
A rubric for the essay grading

Feedback on how to get better grade for the essay

Different comparators result in different kinds of inner feedback *What an item is compared against, changes what is learned*

Integrating dialogical and resource comparisons

Different groups of pupils produce a different output on same topic (e.g. poem, poster, essay) or (e.g. calculation, mind map, conceptual explanation)

Then they compare their outputs with outputs of others and generate feedback on those comparisons.

Possible instructions for comparison:
- ❑ What did you learn from that (each) comparison?
- ❑ How do these different comparators (other students products) change your thinking/understanding of your own product?
- ❑ What are the merits of each type of representational product/output?
- ❑ How would you improve your own work/product based on that comparison?
- ❑ Or focus could be on the communication process, critical thinking

pupils might then engage in dialogue about their comparison findings]

Expanding the purposes of feedback

- ❑ Improve the <u>quality of the work</u> students have produced
- ❑ Better anchor their understanding
- ❑ Examine their own work from different perspectives
- ❑ Envisage other ways of doing things
- ❑ Make connections across concepts
- ❑ Improve (how to do) process understanding
- ❑ Develop students' ability to regulate their own learning

Developing students critical thinking skills through feedback comparisons
(areas of current research)

❏ Theory-practice comparisons

❏ Analysis through different lenses (using different comparators)

❏ Creative thinking – comparators quite different from what students have produced

❏ Problem-solving processes (i.e. thinking process): comparisons against expert think-aloud video, flow chart etc.

❏ Knowledge elaboration/perspectives – different genre comparisons (e.g. poem against essay, diagram versus text)

❏ Metacognition – comparing earlier work with a later work, earlier goals with later goals

❏ Many possibilities in areas of skills or emotional development using narratives as comparison resource

New role for teacher: balancing resource: with dialogic feedback

Designer of comparison opportunities – best placed to select comparators and stage them across course. Over time shift responsibility and ask students to source productive comparators for each other.

Teachers still give comments but sparingly:

Top Tips:

❑ Don't feel you have to comment on every comparison – you don't do this when you give comments which also require comparisons!!

❑ Provide your feedback after other comparisons – reduces unnecessary feedback (workload), helps you target your comments to students' needs and reduces students dependency on you.

Value of this feedback LENS

1. Repositions students as architects of own feedback productions – pushes boundaries of student-centred

2. Provides a conceptual model to leverage what is narturally happening all the time anyway – the making of feedback comparisons

3. Brings into play multiple information sources beyond comments: different comparators = different feedback

4. Tractable way of addressing issue of academic feedback workload [helps 'disentangle' assessment and feedback]

5. And the inherent tension between feedback as telling and idea of developing self-regulated learners.

6. Brings together formal and informal learning in mutually productive ways.

7. Authentic to how feedback is generated in professional settings

Key is that students must make mindful comparisons with explicit outputs. [online environment supports explicitness]

References/resources

Nicol, D. 2020 "The power of internal feedback: Exploiting natural comparison processes" *Assessment and Evaluation in Higher Education,* Online first
https://www.tandfonline.com/doi/full/10.1080/02602938.2020.1823314

Nicol, D., and S. McCallum. 2021. "Making Internal Feedback Explicit: Exploiting the multiple comparisons that occur during peer review". *Assessment and Evaluation in Higher Education*. Online first
https://www.tandfonline.com/doi/full/10.1080/02602938.2021.1924620

Nicol, D., and G. Selvaretnam, G. 2021. "Making Internal Feedback Explicit: Harnessing the comparisons students make during two-stage exams. *Assessment and Evaluation in Higher Education*
https://www.tandfonline.com/doi/full/10.1080/02602938.2021.1934653

Link to short 15 min explanation on youtube https://www.youtube.com/watch?v=rh-MNcnIe7E

Times Higher article with practical examples (short 900 words)
https://www.timeshighereducation.com/campus/guiding-learning-activating-students-inner-feedback

Nicol, D., N. Quinn., L. Kushwah., and H. Mullen. 2021. "Helping Learners Activate Productive Feedback; Using resource and dialogic comparisons, **Presentation at the *Chartered Association of Business Schools (CABS): Teaching, Learning & Student Experience Conference***, 29-30th June. Online.
https://davidnicol.net/files/DN_CABS_2021_TLSE_proceedings.pdf

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