



CHI 2020 Workshop on Detection and Design for Cognitive Biases in People and Computing Systems
April 25, 2020 • <http://critical-media.org/cobi>

Learning to Reflect on Challenging Experiences: An AI Mirroring Approach

Simon Buckingham Shum¹ & Cherie Lucas²

¹ Connected Intelligence Centre

² School of Pharmacy, Graduate School of Health
University of Technology Sydney
[@sbuckshum](#) [@LucasReflection](#)

Proposition:

a distinctive role that analytics and AI can play is to **hold up a 'mirror' to online writers**, to make them more aware of, and reflective about, their **reactions to challenging people and experiences.**

On the one hand, we have text analytics to detect the presence (absence!) of **factual claims** and **reasoning/argumentation**

See research on

- *automated writing evaluation*
- *argument mining*

Analytical Report	Feedback	Examples
<p>The analytical report highlights salient rhetorical moves AcaWriter identified in your essay for reflection. For more specific feedback, go to the Feedback tab.</p> <h3>Rhetorical Moves</h3> <ul style="list-style-type: none">S Summarises or signals the authors goalsP Perspective or stanceE Emphasis to highlight key ideasN Novel improvements in ideasC Contrasting idea, tension or critical insightB Background information and previous workS Surprising or unexpected findingQ Question or gap in previous knowledgeT Trend or tendency related to ideas		
<h4>Introduction</h4> <p>Rapidly advancing technology has been seen as a marker of contemporary modernity. It has been a formidable vessel in transporting old world values and traditions into a new world of innovation and deviation. In the legal world, the growing area of cyber-crime, metadata and privacy laws all affirm the idea that technological change is inescapable. C Q However, little research has been conducted to assess the benefits and risks of these innovations as they would apply to civil practice. S</p> <p>This essay will review the implementation of video conferencing technologies in courts. N</p> <p>C It will argue that this innovation reflects an attempt by the judiciary to give effect to case-</p>		

On the one hand, we have text analytics to detect the presence (absence!) of **factual claims** and **reasoning/argumentation**

See research on

- *automated writing evaluation*
- *argument mining*

The screenshot shows the 'Analytical Report' tab of the AcaWriter interface. It features a blue header bar with 'Analytical Report', 'Feedback', and 'Examples' tabs. Below the header, a paragraph states: 'The analytical report highlights salient rhetorical moves AcaWriter identified in your essay for reflection. For more specific feedback, go to the Feedback tab.' This is followed by a section titled 'Rhetorical Moves'. A large green callout box with a speech bubble tail pointing to the left contains the text: 'Great if you want to improve the analytical clarity of your writing (or give that impression...)'. The background text of the report includes a paragraph about modernity and innovation, with several sentences highlighted in yellow and marked with colored circles (C, Q, S, N) indicating rhetorical moves. The highlighted text includes: '...ed finding to ideas', 'modernity. It has a new world of innovation and deviation. In the legal world, the growing area of cyber-crime, metadata and privacy laws all affirm the idea that technological change is inescapable. (C) (Q) However, little research has been conducted to assess the benefits and risks of these innovations as they would apply to civil practice. (S) This essay will review the implementation of video conferencing technologies in courts. (N) (C) It will argue that this innovation reflects an attempt by the judiciary to give effect to case-

On the one hand, we have text analytics to detect the presence (absence!) of **factual claims** and **reasoning/argumentation**

See research on

- *automated writing evaluation*
- *argument mining*

Analytical Report Feedback Examples

The analytical report highlights salient rhetorical moves AcaWriter identified in your essay for reflection. For more specific feedback, go to the Feedback tab.

Rhetorical Moves

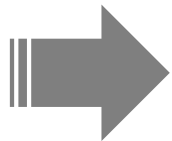
ed finding
to ideas

modernity. It has
been a formidable vessel in transporting old world values and traditions into a new world of
innovation and deviation. In the legal world, the growing area of cyber-crime, metadata and
privacy laws all affirm the idea that technological change is inescapable. **C Q** However,
little research has been conducted to assess the benefits and risks of these innovations as
they would apply to civil practice. **S**
This essay will review the implementation of video conferencing technologies in courts. **N**
C It will argue that this innovation reflects an attempt by the judiciary to give effect to case-

However, in polarized debates, few people are going to shift their view by **mere force of argument**

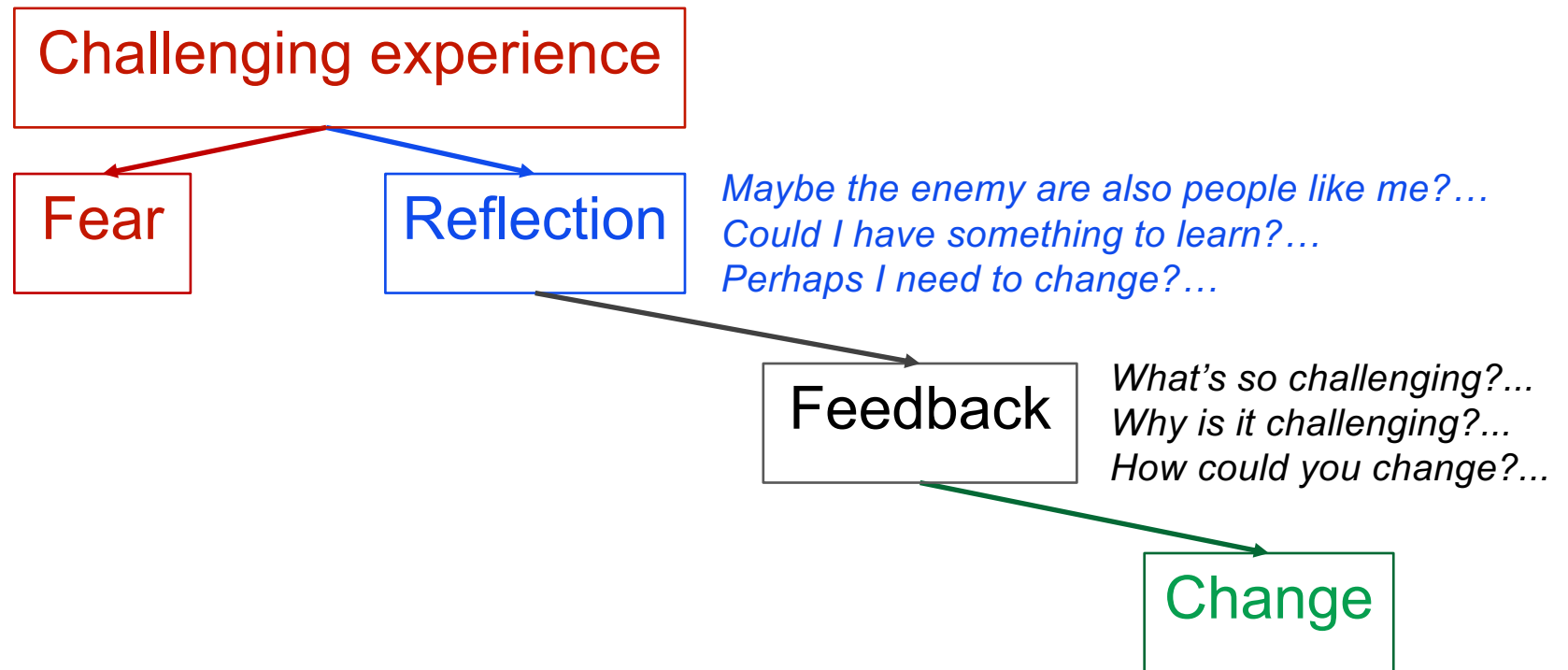
From argumentation to **reflection**...

Re-humanization of 'the other'
is central



Build common ground through shared experience, rather than try to resolve differences head-on?

Argument:



Underlying model of reflection

distilled from the literature on teaching and learning reflective writing

Thoughts	Feelings	Challenge	Self critique	Potential solution	Learning opportunity
CONTEXT		CHALLENGE		CHANGE	
Narrative					

Underlying model of reflection

distilled from the literature on teaching and learning reflective writing

Depth	Intention						
	Integration						
	Internalisation						
	Interpretation						
	Impression						
		Thoughts	Feelings	Challenge	Self critique	Potential solution	Learning opportunity
		CONTEXT		CHALLENGE		CHANGE	
		Narrative					

Underlying model of reflection

distilled from the literature on teaching and learning reflective writing

Depth	Intention						What change is likely to lead to future benefits?
	Integration			What impact on my goals/aspirations?	What other ideas could I use to change myself?	How do others address these challenges?	How can I learn from other perspectives?
	Internalisation		What do these feeling say about me?	How is this a problem that challenges me?	Why do I need to change?	How can I change?	
	Interpretation	What does it mean for me?	Why do I feel this way?				
	Impression	What do I notice about my situation?					
		Thoughts	Feelings	Challenge	Self critique	Potential solution	Learning opportunity
		CONTEXT		CHALLENGE		CHANGE	
		Narrative					

AcaWriter automated annotation

Pharmacy Masters
students reflecting on
work placements

Reflective Report Feedback Resources

- ✓ ■ Initial thoughts and feelings about a significant experience.
- ✓ ● The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
- ✓ **Deeper reflection, personally applied.**
- ✓ ► How new knowledge can lead to a change
- ✓ Expressions indicating belief, learning, or knowledge.
- ✓ *Expressions indicating self critique*
- ✓ *Words associated with strong feelings*
- ✓ ⚡ Sentence too long, might disengage the reader. Try breaking it into smaller sentences

AcaWriter automated annotation

Pharmacy Masters students reflecting on work placements

Reflective Report

Feedback

Resources

- ✓ ■ Initial thoughts and feelings about a significant experience.
- ✓ ● The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
- ✓ **Deeper reflection, personally applied.**
- ✓ ► How new knowledge can lead to a change
- ✓ Expressions indicating belief, learning, or knowledge.
- ✓ *Expressions indicating self critique*
- ✓ *Words associated with strong feelings*
- ✓ ⚡ Sentence too long, might disengage the reader. Try breaking it into smaller sentences

outcomes for the patient. ► **Thus, this experience taught me that in future, *I must* take a patient-centred approach.** ■●► *I must* spend time addressing the patients concerns and demonstrate excellent communication with them so they can fully understand their clinical picture and history. This relates to Domain 2: Communication and Collaboration, Standard 4: Apply Interpersonal Communication Skills to Address Problems, which is a standard in the National Competency Standards Framework for Pharmacists in Australia (2016). The incident has taught me to use a whole range of communication techniques when counselling a patient. It gave me the opportunity to practice this sort of behaviour in my subsequent weeks of clinical placement. ● **It has strongly encouraged me to shift my perspective to one that focuses more on patient-centred care.** ■ I personally think that this is crucial in ensuring that a patient's health objectives are met. This standard I have obtained is important for any practising pharmacist.

AcaWriter feedback

Pharmacy Masters students reflecting on work placements

Computers don't read writing like humans. So, if you're sure your writing's good, it's fine to disagree with AcaWriter's feedback, just like you'd ignore a poor grammar suggestion.

Reflective Report

Feedback

Resources

- ❗ Perhaps consider introducing your first thoughts, feelings and/or reactions to an incident, or learning task, within the first paragraph. AcaWriter couldn't spot this within first paragraph
- ✅ You have reflected on your beliefs/learning/knowledge.
- ✅ You seem to have incorporated a deeper reflection indicating self-critique.
- ✅ It appears that you have reflected in a deeper way about how your experiences connect with your professional development.
- ✅ It appears that you've reported on something you found challenging.
- ❗ It appears that you haven't commented on what you would do differently should the same event occur in the future. Perhaps think about changes in perspectives/strategies/tools/ideas/behaviour and/or approach.
- ✅ It appears that you may have expanded the detail on the challenge you faced. (1)

AcaWriter automated annotation

Spaceship Media's *Alabama-California Conversation Project*

After participating in this group, it's not hard to figure out why this country is so partisan and divided. Because listening to each other, truly listening to different perspectives and having productive respectful dialogue, is damn hard.

When I'm responding to a question, my process is to usually yell at my computer, furiously | type, stop, erase, furiously type, stop, yell, calm down and then think more deeply about my words.

■ ● **As difficult as this is to do, when I take the time to think more deeply about the words I write, I tend to also think more deeply about the words I hear.** And that is always worthwhile.

● Don't misunderstand, I'm not running out and voting Republican next time around, nor am I less concerned with a Trump presidency, but that was never the point. I believe what I believe and I believe that I am right, but so does everyone. So for me, moving forward means more listening, more conversations and more women in Alabama.

-
- Initial thoughts and feelings about a significant experience.
 - The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
 - ▶ How new knowledge can lead to a change

Expressions indicating belief, learning, or knowledge learning, or knowledge

Expressions indicating self critique

Deeper reflection, personally applied

Summary

Designing AI mirrors to provoke deeper human reflection could be an important form of machine augmentation for human sensemaking

Such tools could make citizens more self-aware of their biases, making them less reactive, and more open to new perspectives when their assumptions are challenged

You can't force introspection, but if someone is disposed to, AI can provide personalised coaching on written reflection, at scale

Reflective writing analytics could also enable content analysis for media analysts, educators, citizens, forum moderators, etc.