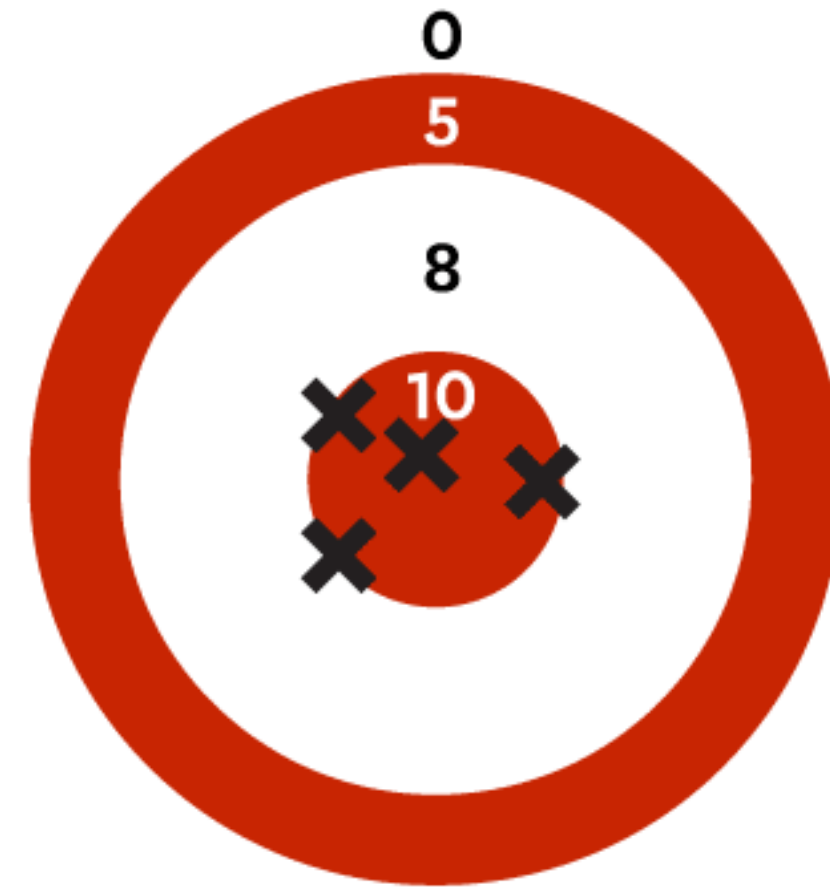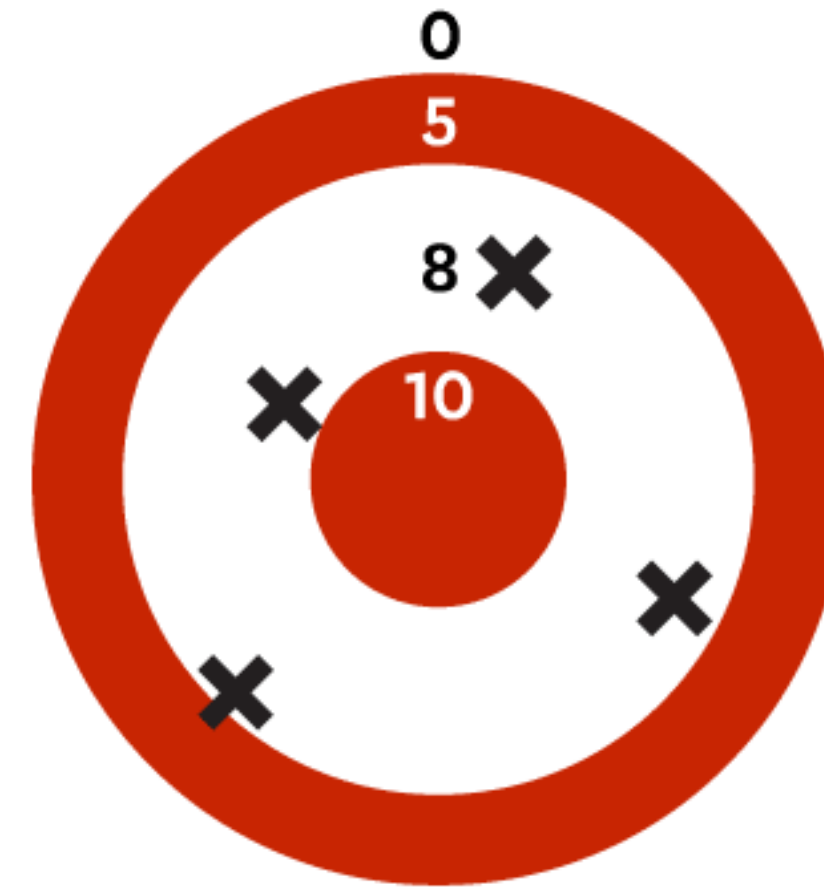# Silence in the Court:
Antifragile Data and Debate in Noisy Times

Ruben R. Puentedura, Ph.D.
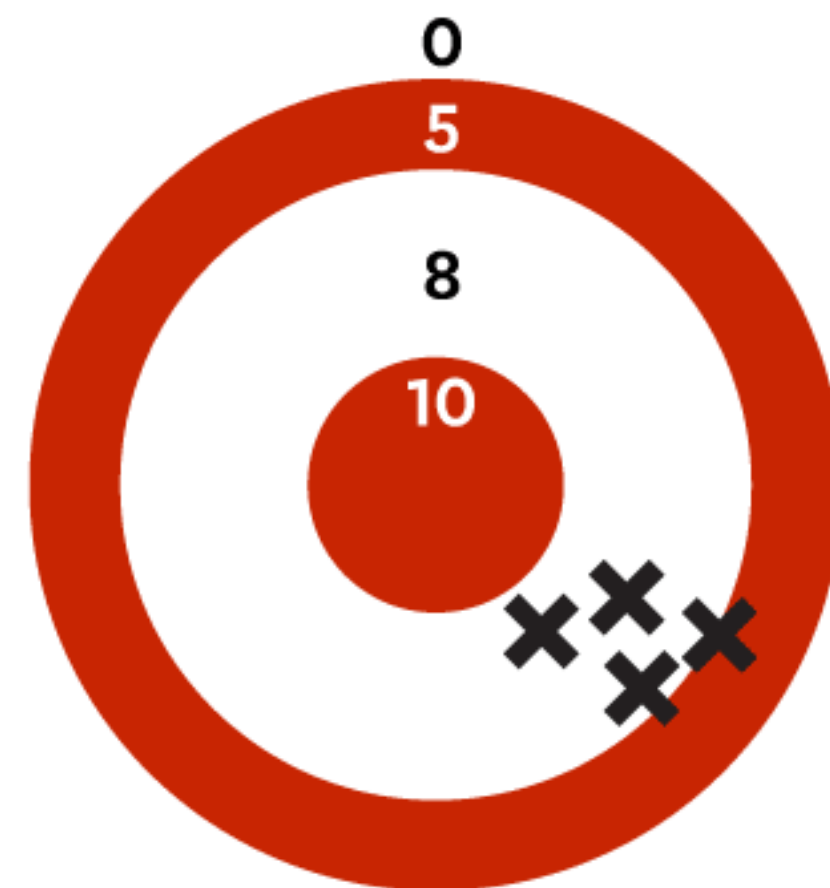
How Noise and Bias
Affect Accuracy

A. Accurate

B. Noisy
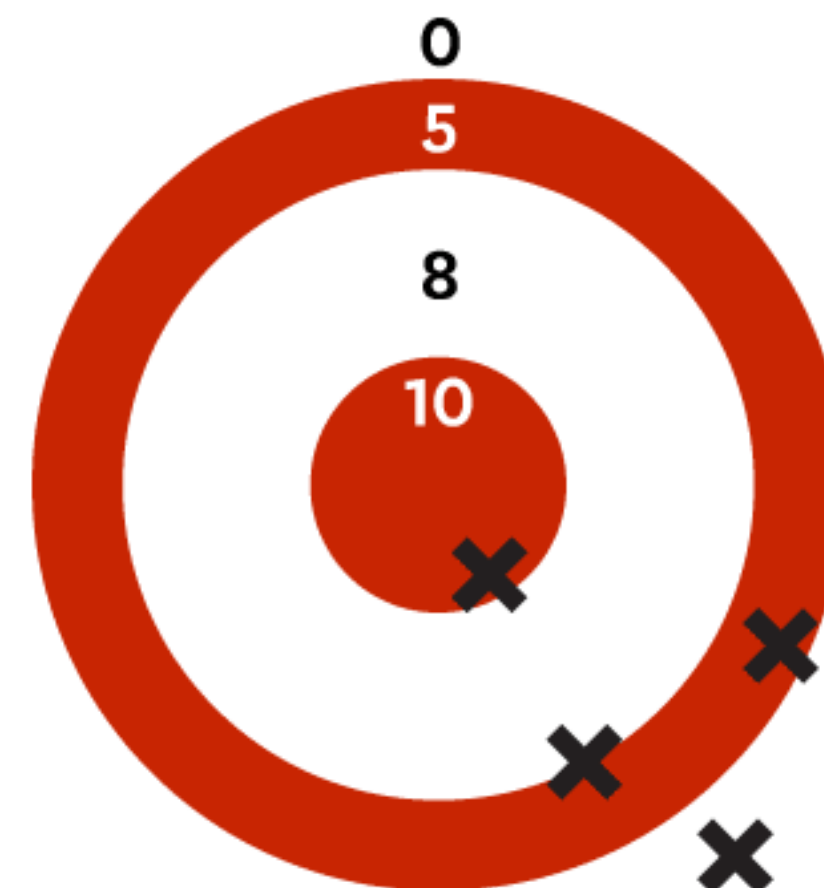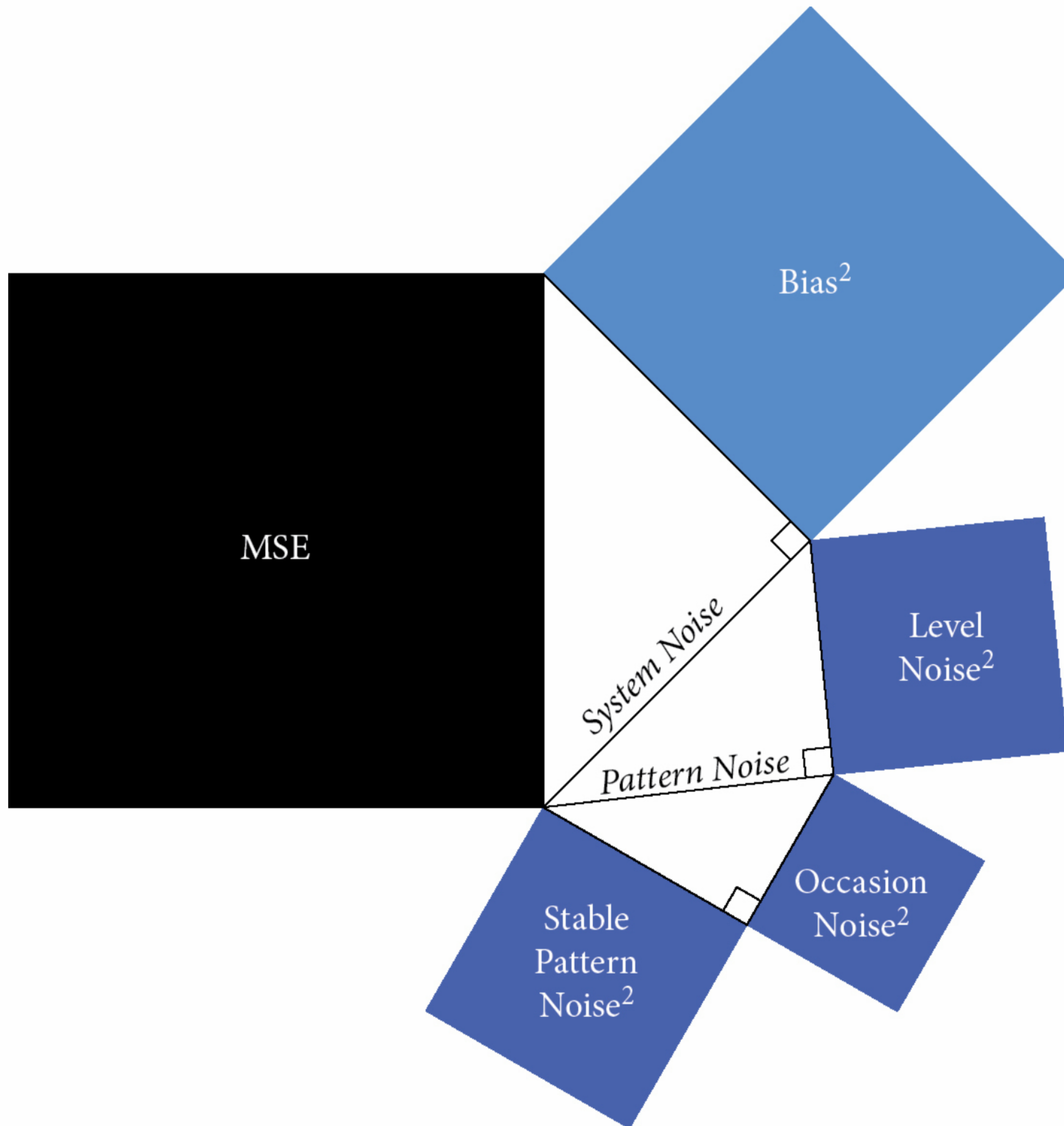
C. Biased

D. Noisy and biased

MSE

Bias^2

System Noise

Pattern Noise

Level Noise^2

Stable Pattern Noise^2

Occasion Noise^2

Kahneman, D., Sibony, O., & Sunstein, C. R., *Noise: a flaw in human judgment*. Little, Brown Spark. (2021)

Sources of Reduction in Accuracy

- Bias

- System Noise

  - Level Noise

    - *Variability in average response across multiple cases by different respondents*

  - Pattern Noise

    - Stable Pattern Noise

      - *Variability in responses in specific cases by different respondents*

    - Occasion Noise

      - *Variability within a set of responses by individual respondents*

The Modified Delphi Process

Wanted: the Relevant Knowledge
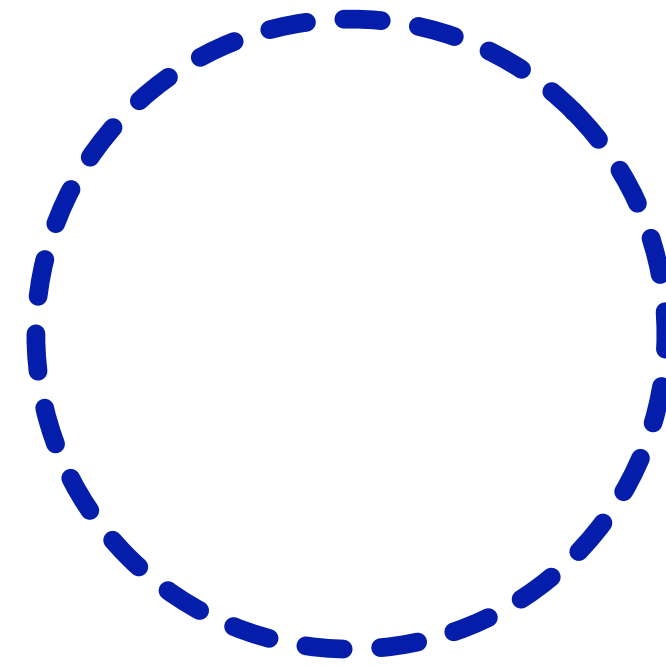
Stage 1: Seeding the Field
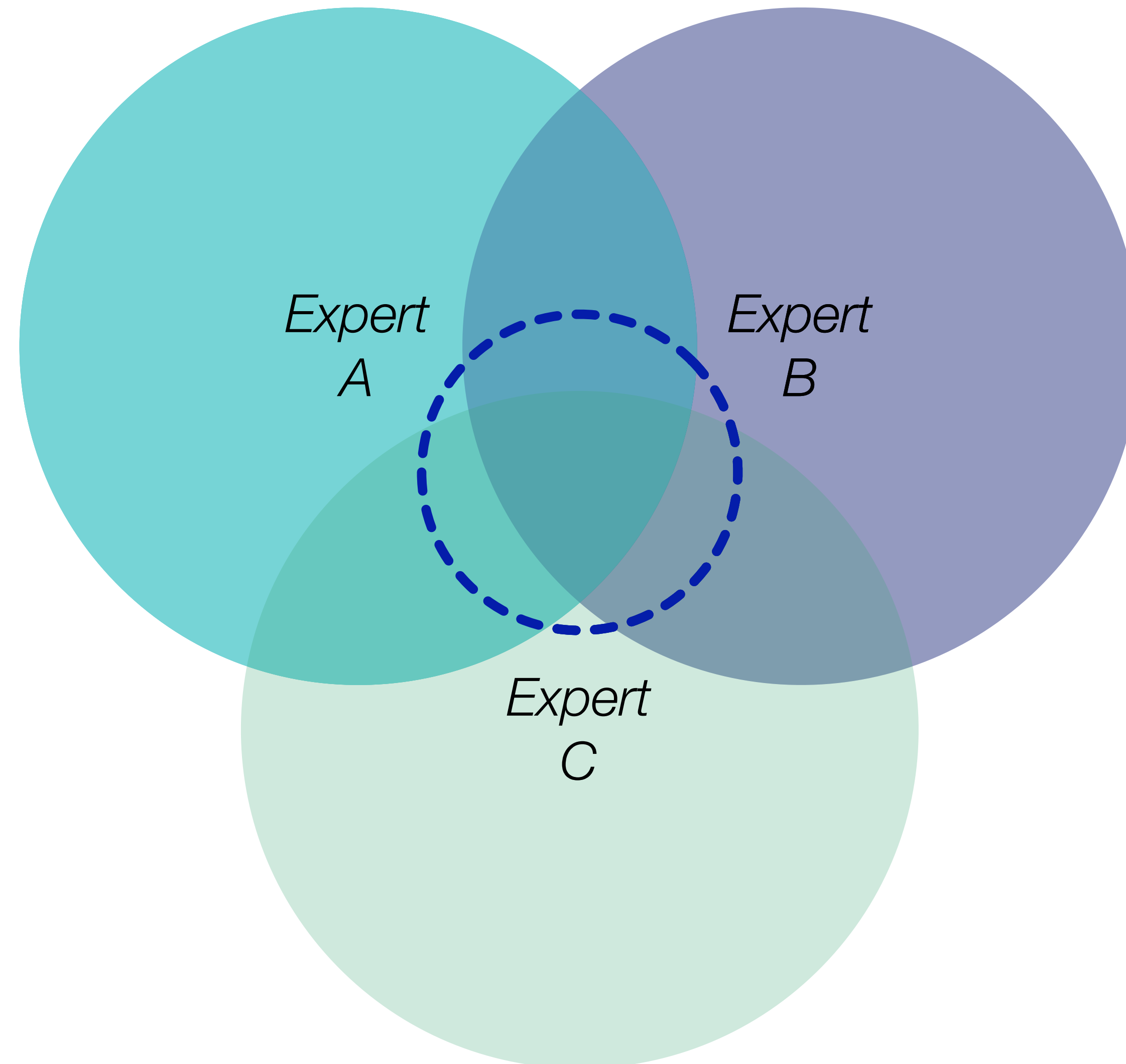
What are the essentials – e.g. technological tools, pedagogical frameworks, etc. – that all faculty should have in their toolkit so as to support their students' learning?

https://tinyurl.com/MD2021Q1

Stage 2: Aggregating the Replies

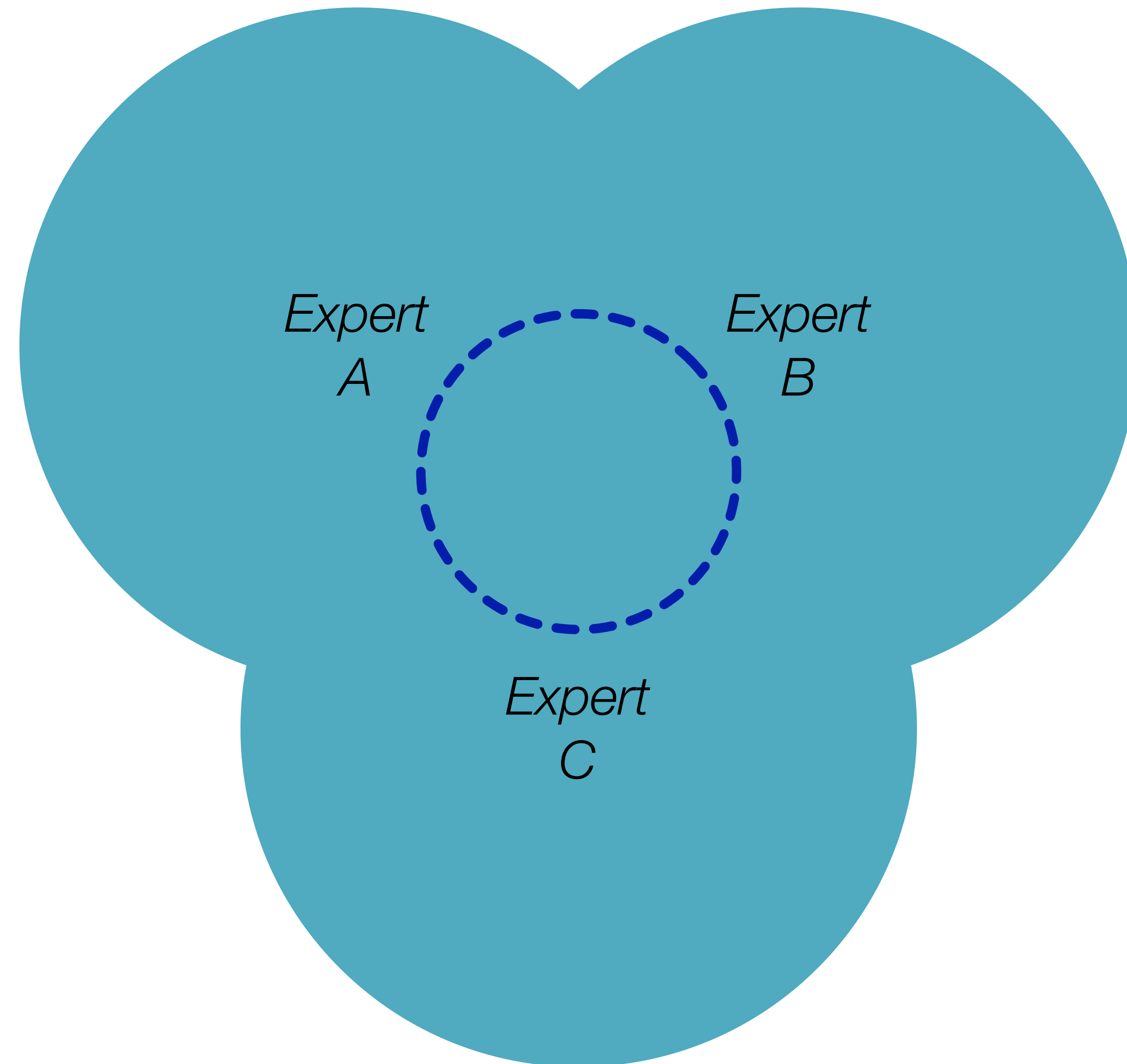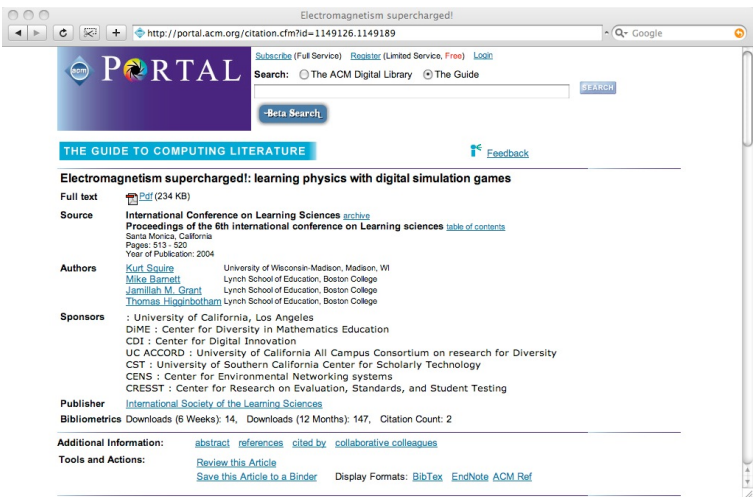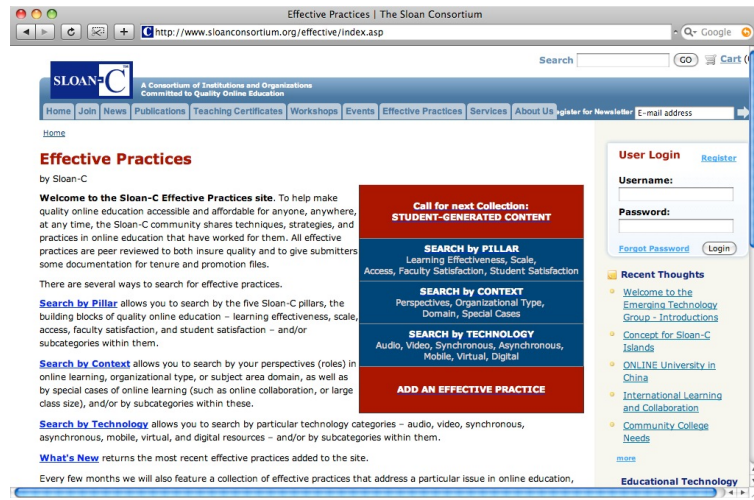# Stage 3: Informing the Process

Expert A

Expert B

Expert C
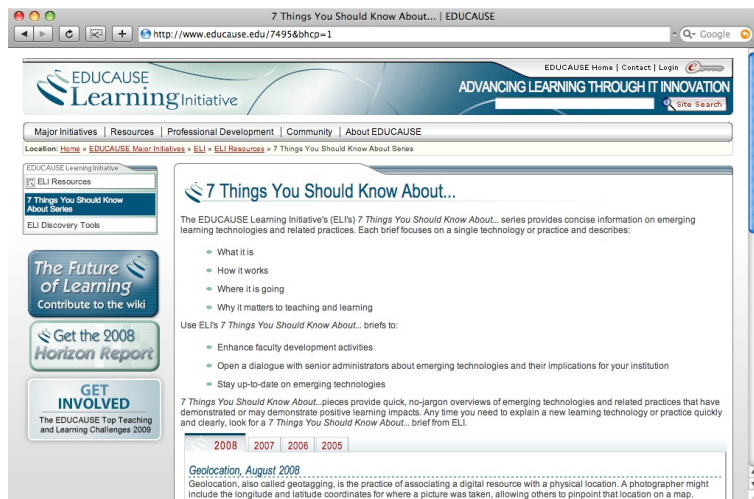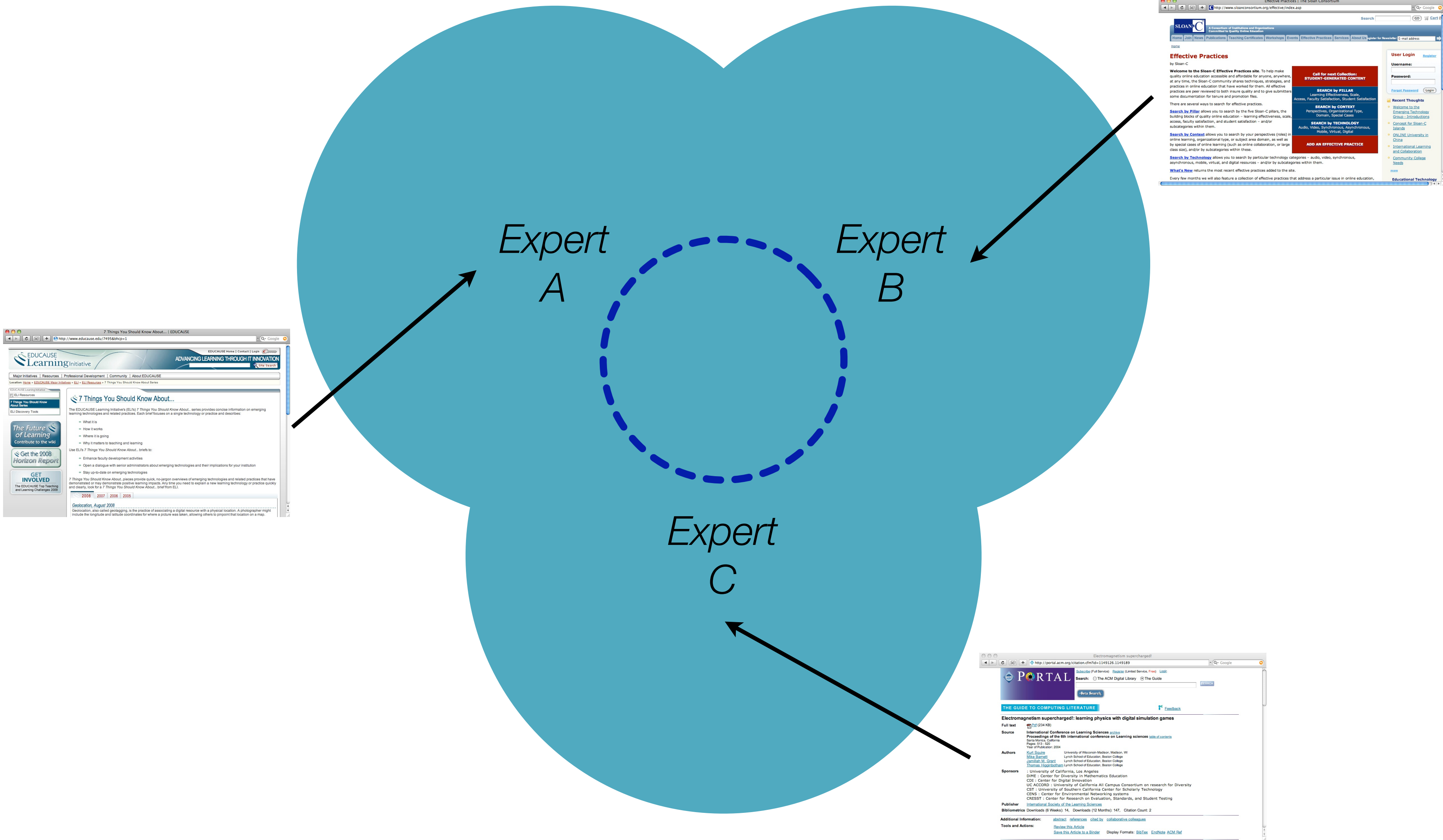
Stage 4: Winnowing Down the Results
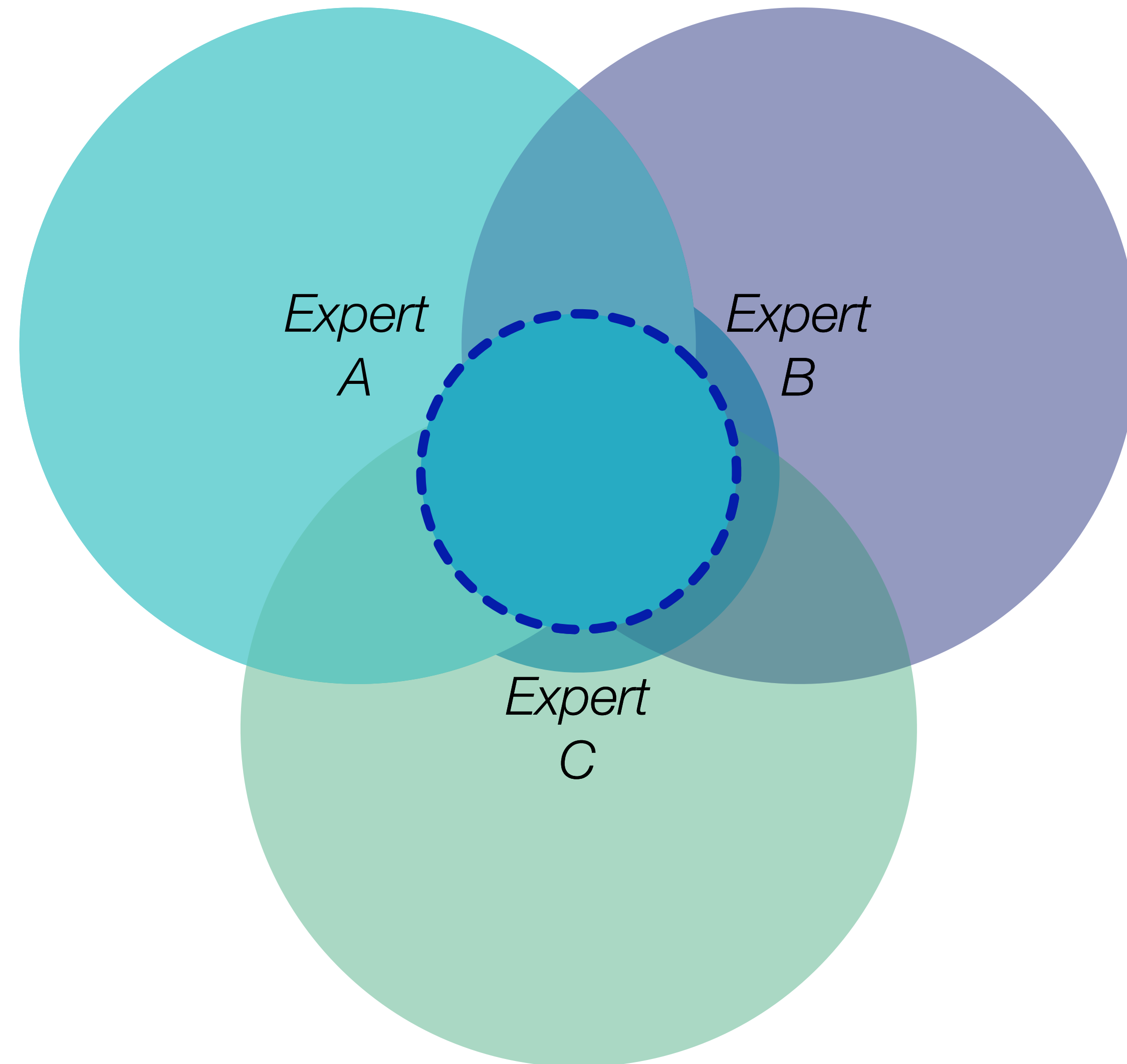
The First Round Voting Method

- Every participant gets a number of "tokens" to distribute among their preferred replies

- The number of tokens T is determined by the number of replies, according to the following formula:

$$\# \ of \ tokens = \sqrt{\# \ of \ replies}$$

- A participant can distribute their tokens any way they want – for instance, if a participant got 7 tokens, they could:

  - Put 1 token on each of 7 different replies

  - Put all 7 tokens on one reply

  - Put 2 tokens on one reply, 4 tokens on a second reply, and 1 token on a third reply

    …

- Voting is private

- The top T replies will be selected for the second round of voting

  - If several replies tied for last place, all should be included, so more than T replies may go to the next round

Challenges Facing Higher Education (Source: APLU)

1. Academic freedom/freedom of speech
2. Academic quality
3. Affordability
4. Competition from non-trad. postsecondary programs
5. Decrease in high school student population
6. Diversity & inclusion of students, faculty, and staff
7. Evolving workforce needs for graduates
8. Government funding
9. Graduation rates
10. International enrollment
11. K-16 partnerships
12. Rankings
13. Research security
14. Serving nontraditional students
15. Sexual assault/harassment
16. Student enrollment
17. Student mental health/well-being
18. Student success/retention

https://tinyurl.com/MD2021Q2

The Second Round Voting Method

- In this round, every participant gets $\sqrt{T}$ tokens to distribute among their preferred replies, where T is the number of replies selected for Round 2

  - If T=7, then the number of tokens is $\sqrt{7} \approx 3$

- As in the previous voting round, a participant can distribute their tokens any way they want – they could:

  - Put 1 token on each of 3 different replies

  - Put all 3 tokens on one reply

  - Put 2 tokens on one reply, and 1 token on a second reply

- As before, voting is private

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	SCD;09NOV21															
2	RowNr;RD;RA;CD;CA;AL;FNR;SNR;DEP;ARR;STD;DDC;STA;ADC;Mo;Tu;We;Th;Fr;Sa;So;ACtype;ACtypefullname;AG;AGfullname;Start_Op;End_Op															
3	25	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
4	30	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
5	33	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
6	34	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0	1	
7	35	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
8	36	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
9	40	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
10	41	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0	1	
11	42	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
12	43	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0	1	
13	45	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
14	46	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
15	53	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0	1	
16	59	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0	1	
17	66	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
18	67	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
19	68	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
20	69	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
21	70	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		2
22	71	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		2
23	72	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		2
24	73	EU	EU	DE	DE	LH	LH004	0	FRA	HAM	700	0	805	0		
25	89	EU	EU	DE	DE	LH	LH005	0	HAM	FRA	700	0	810	0		

Resources

- **Jason Davies' Tools for Text Analysis:**
  - *Word Cloud Generator:* https://www.jasondavies.com/wordcloud/
 - *Word Tree:* https://www.jasondavies.com/wordtree/
- **The Delphi Method:**
  - Harold A. Linstone and Murray Turoff (Eds.) *The Delphi Method: Techniques and Applications*. Online at https://web.njit.edu/~turoff/pubs/delphibook/index.html
- **Noise and Bias:**
  - Kahneman, Daniel, et al. "Noise: How to Overcome the High, Hidden Cost of Inconsistent Decision Making." Online at https://hbr.org/2016/10/noise
  - Kahneman, D., Sibony, O., & Sunstein, C. R. (2021). *Noise: a flaw in human judgment*. Little, Brown Spark.

Hippasus
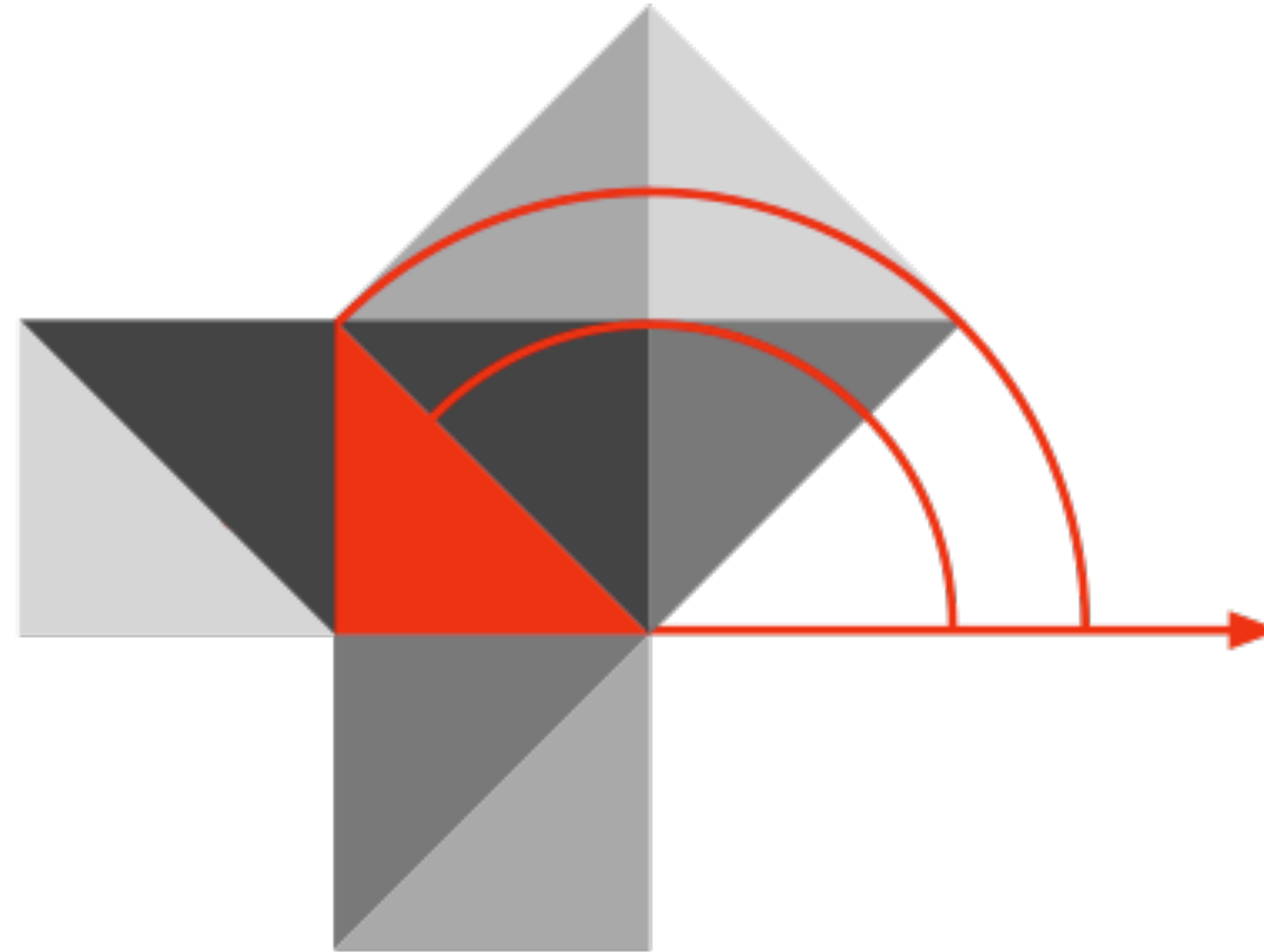
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Twitter: @rubenrp