

# Asking for what we want:

Identification & alignment of valued writing abilities  
with writing instruction in biological sciences

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# Faculty-generated abilities

## Section 2: Desired Writing Abilities in Ecology, Evolution, Behavior:

### Novice (developed throughout the undergraduate curriculum, beginning in 1XXX and 2XXX courses)

- Write concisely, avoiding unnecessary language or information
- Describe observations and procedures concretely (avoiding abstract language or subjective characterizations)
- Write with biological accuracy (i.e., without teleology or anthropomorphosis)
- Use the appropriate scientific template when necessary to structure assignments (e.g., scientific papers, diagnostic keys)
- Interpret, construct, integrate, and properly caption and format figures and tables
- Create cohesive narratives that are structured to flow logically from one point to the next
- Use grammar and tone that are appropriate for the intended audience

### Intermediate (developed in core 3XXX courses and upper-division electives)

- Formulate research or thesis questions that are appropriate in scope and topic
- Describe quantitative analyses accurately (e.g., statistical results and mathematical solutions)
- Argue logically and persuasively, using appropriate evidence
- Analyze for cause and effect
- Use writing to develop and deepen thinking
- Work and write collaboratively
- Write in a style that focuses on results (rather than on those who obtained the results)

### Advanced (developed primarily in upper-division electives)


- Select appropriate (i.e., peer-reviewed) sources from the primary and secondary literature; interrogate those sources by evaluating them for logic, consistency, and soundness; and acknowledge those sources appropriately
- Develop independent, logical conclusions by synthesizing information from disparate sources, including original data and published studies
- Recognize the importance of variability in biological systems in the design and interpretation of research and in the synthesis of findings across studies

What characterizes writing in the discipline?

Which abilities are present in course materials?

Where are abilities are presented? Are writing abilities presented and assessed 'implicitly' or 'explicitly'?

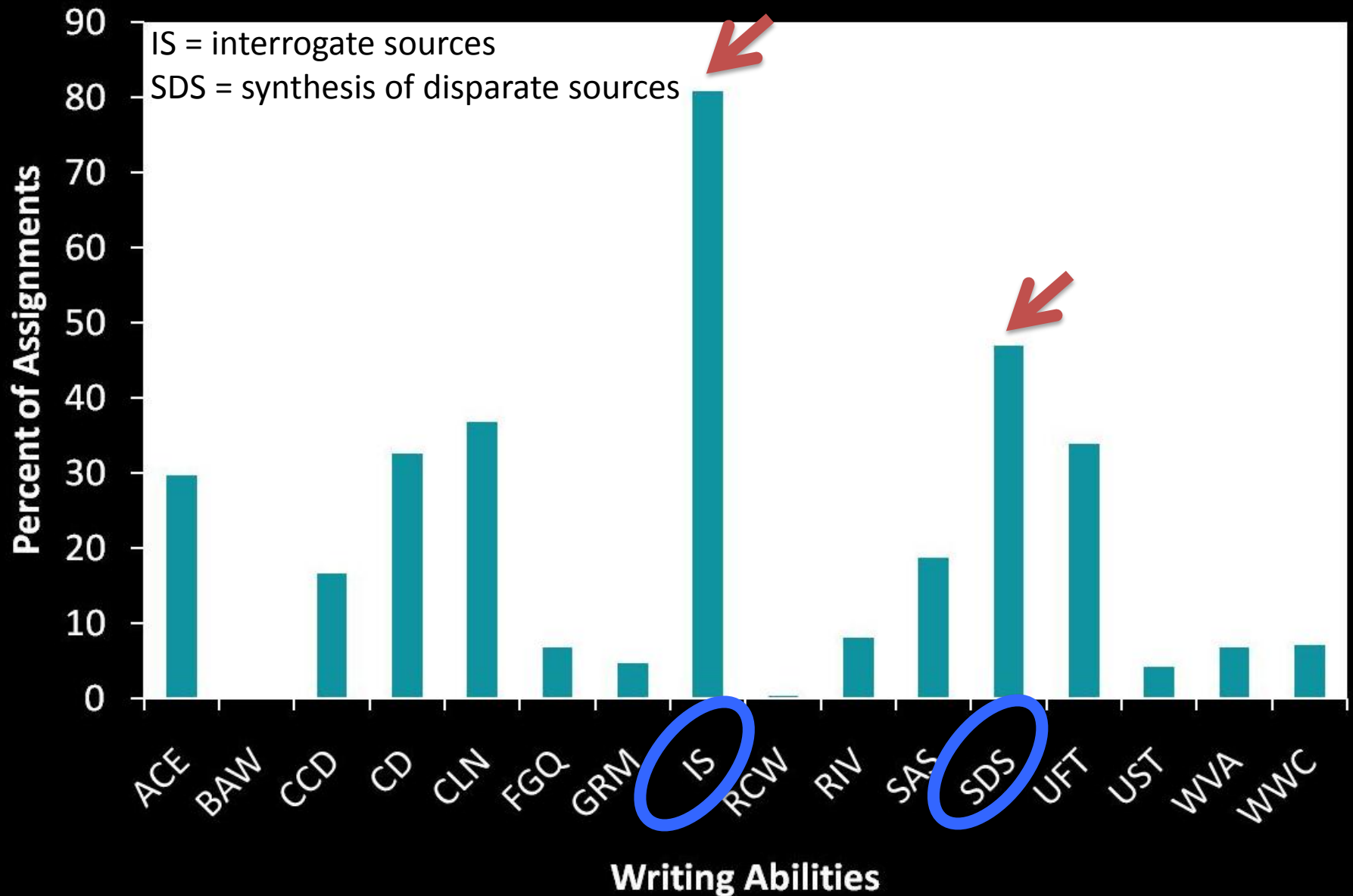
# What characterizes writing in the discipline?



	3000 LEVEL								4000 LEVEL						5000 LEVEL							
	1	2	3	4	5	6	7	%	1	2	3	4	5	6	%	1	2	3	4	5	6	%
Worksheet/Problem Set	x			x	x			43%	x	x	x		x	x	83%	x				x	x	50%
Informal Paper, 1-3 pg	x	x	x	x	x	x	x	100%		x			x		33%						x	17%
Informal Paper, 4-10 pg						x	x	29%							0%							0%
Formal Paper, 1-3 pg	x	x			x			43%				x			17%		x	x				33%
Formal Paper 4-10 pg		x	x	x		x		57%		x			x	x	50%				x	x		33%
Individual Presentation	x	x						29%							0%					x		17%
Group Presentation	x		x				x	43%				x		x	33%		x	x			x	50%
Peer Review						x	x	29%					x	x	33%		x					17%
Self/Peer Evaluation	x							14%					x		17%		x					17%
Critical Reading Questions								0%	x			x	x		50%	x	x					33%

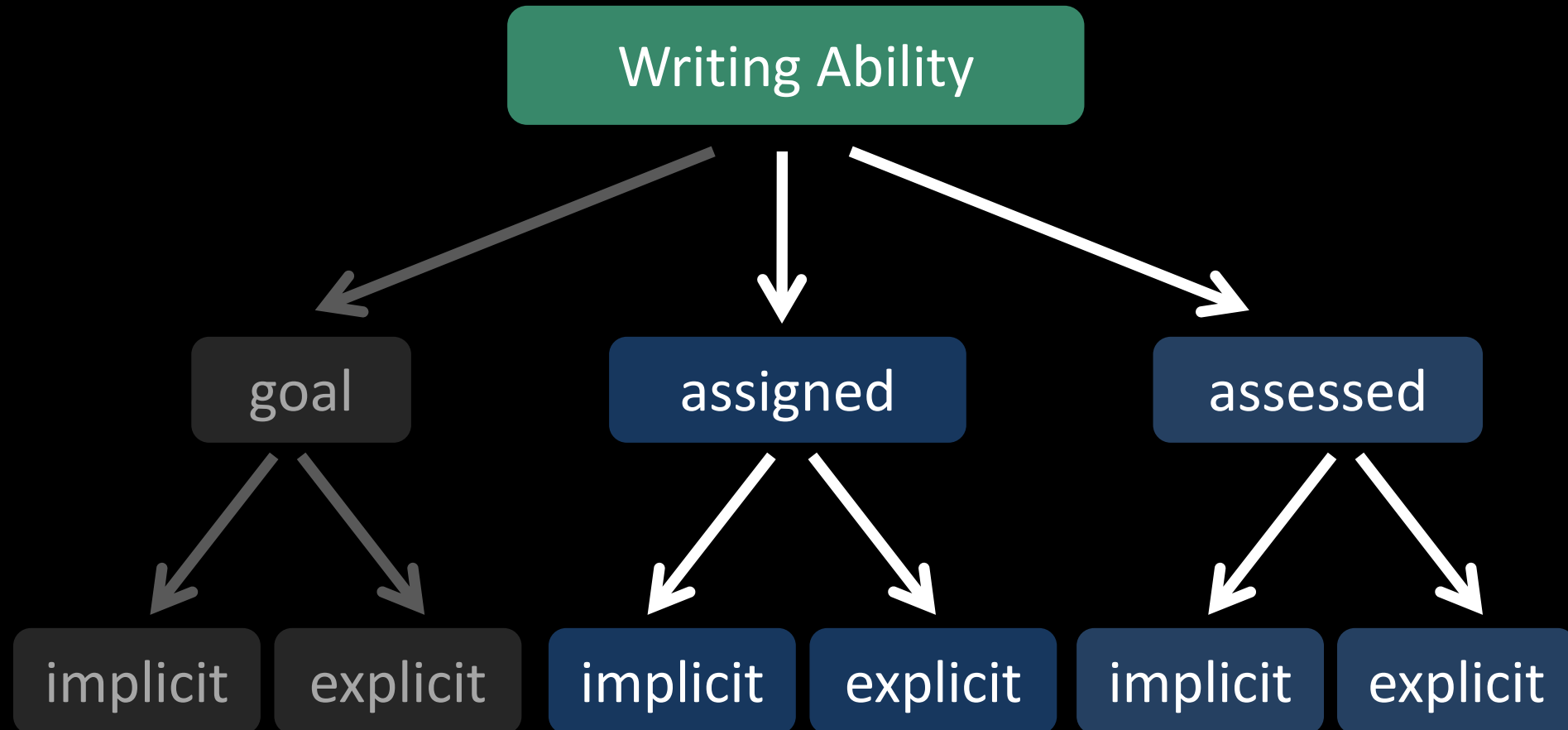
- average amount of writing per course: > 12 pages (only 2 WI courses)
- most pages written in 3000 level courses, least in 4000 level courses (extensive quantitative work)
- informal writing is most common in 3000 level courses

# Which abilities are present in course materials?



# Where are abilities are presented?

## Are writing abilities presented and assessed 'implicitly' or 'explicitly'?



# Implicit vs. Explicit Example

Assignment Type: *Critical Reading Questions*

Ability: *Interrogating Sources*

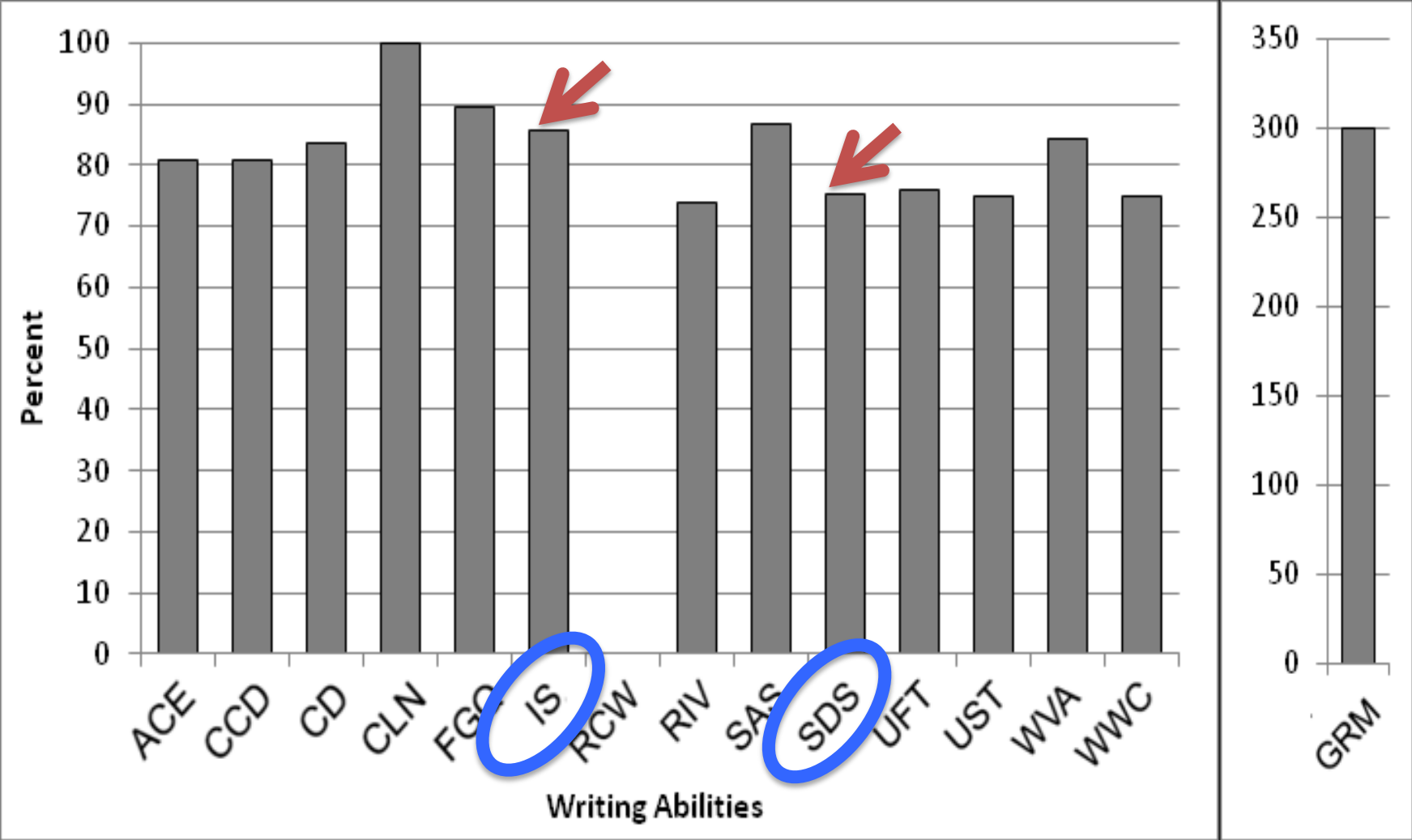
Implicit: Submit 2 questions for the paper authors.

Explicit: Submit 2 questions about the paper.

## *Guidelines for Developing Questions*

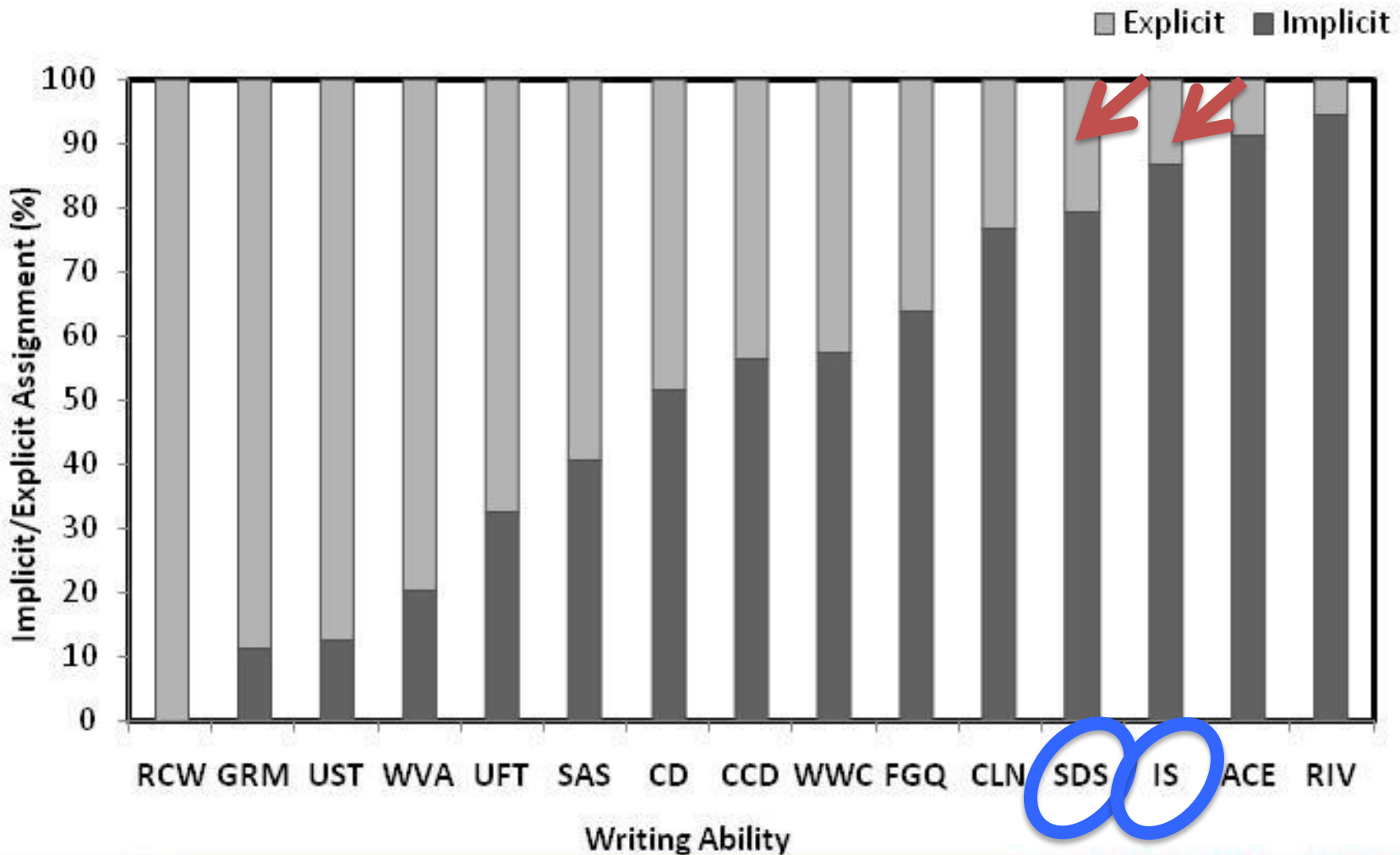
- indicate depth of thought, *not*, "why did the author study X?"
- ask about something you don't understand
- ask about something that seems to contradict something else we've learned
- ask about something that was not clarified by the paper

~75% of explicitly assigned abilities are assessed





# Abilities communicated implicitly vs. explicitly



RCW = results centered writing

GRM = grammatically accurate writing

ACE = analyze for cause and effect

RIV = recognize the importance of variability

# “asking for what we want”

- need for communication of goals/purpose
- need for clear alignment between assignment and assessment of abilities (& goal)
- need for more explicit communication, especially of highly valued abilities

RESOURCES FOR FACULTY AND STAFF

College of Biological Sciences

- Human Resources
- Planning and governance
- Research resources
- Information technology
- Communications
- Seminars
- Faculty + staff awards >
- Undergraduate teaching resources** ▾
- Teaching in CBS
- Teaching with writing
- Supporting students
- Policies
- College committees + Department leadership
- Awards + recognition
- Contact us

## Teaching with writing

### Center for Writing

The Center for Writing has resources for faculty and students

Teaching with writing workshops

#### Help for international or multilingual student writers

- The Student Writing Support program in the Center for Writing employs multilingual specialists. Your students can select a specific consultant and make weekly appointments if needed.
- Advice from Sheryl Holt, the Coordinator for non-native speakers, on responding to non-native speakers
- More advice on responding to non-native speakers
- Voices of Minnesota's multilingual writers (*videos about learning to write American academic English*)
- Student writing support for multilingual writers
- Valuing written accents, *a project at George Mason University*

### Updated guidelines for WI courses

The guidelines for University of Minnesota writing intensive courses have changed to be more flexible. For help in developing a WI course, please contact Leslie Schiff, [schiff002@umn.edu](mailto:schiff002@umn.edu).

### CBS Writing Enriched Curriculum Project

The CBS Writing Enriched Curriculum Writing Plan (2010)

- CBS-defined discipline-specific writing characteristics *CBS faculty the Writing Plan*

**Jump to**  
[Center for Writing](#)

[Updated guidelines for WI courses](#)

[CBS Writing Enriched Curriculum project](#)

[Writing instruction tools](#)

[Example assignments + course materials](#)

## DEPARTMENT OF ECOLOGY, EVOLUTION AND BEHAVIOR

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## Writing in science

Why write in science and science classes?

Writing is integral to many fields of science - as scientists we use writing to communicate our research and ideas and to synthesize our rapidly changing fields. Writing assignments are designed to help you learn to think critically about specific scientific issues that you encounter as a citizen in your day-to-day life; to help you draw conclusions from multiple primary sources and clarify information about some of the current controversies and unresolved issues in a specific field; and to help you develop written communication abilities that you can use as you pursue your post-graduate career or further study.

This site includes links to resources specific to EEB and writing within these disciplines, but also links to general writing resources that may be useful to undergraduates and graduate students alike. In addition to the EEB Department's writing plan there is a link to a faculty-defined list of writing abilities which represent goals for undergraduate EEB majors. These abilities are utilized throughout the undergraduate curriculum and the list is intended as a reference to help students and faculty develop a common language related to writing abilities and expectations.

### Writing in EEB Courses:

[EEB Departmental Writing Plan](#)  
EEB Department aims for writing instruction as well as a plan to achieve those aims.

### EEB Writing Ability List

Descriptions of writing abilities taught in EEB courses and expected of majors by graduation.

### Assignment Checklist for Students [In development]

Includes a list of questions to ask oneself (or your professor/TA) before beginning any writing assignment.

### UMN Library Resources:

[Assignment Calculator](#)

Helps establish intermediate deadlines in order to complete assignments on time.

# Interrogating Sources Tools

## Interrogating Sources

### Developing critical reading skills

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**Background:** Critical reading skills have been highlighted as a key area in which EEB faculty and student opinions differ on student writing abilities. This teaching tool has been developed in order to clarify expectations of students and help students develop this skill set to a high level of achievement.

↗

#### Activities Overview:

##### 1. How-to read a scientific paper

This in-class, instructor-led activity walks students through the format of a scientific paper and highlights the key information present in each section of the paper. After this activity students will be able to comfortably read and extract key information from scientific literature.

↗

##### 2. Navigating a scientific paper

This out-of-class individual assignment reinforces students' prior knowledge about the structure of a scientific paper. After this activity students will be able to recognize and retrieve key information from scientific literature.

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##### 3. Group discussion of papers

Provided here are some examples to help different levels of students reach specific learning outcomes, but this activity can easily be reworked to help students achieve unique learning outcomes.

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###### a. Discussion of a single paper (Introductory students)

In this activity students compare their readings and interpretation of the same scientific paper in order to reach a consensus opinion. After this activity students will be confident in their ability to retrieve key information from scientific literature and ready to continue this process independently.

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###### b. Discussion of a single paper (Writing focus)

In this activity students reflect on the quality of writing in an example paper, how the writing influenced their ability to read and make sense of the paper, and their own strengths and weaknesses as writers. After this activity students will be better prepared to plan and develop their independent writing projects.

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###### c. Discussion of papers on a similar topic (Writing focus)

In this activity for mid-level students, each student reads a different paper on the same topic. In a group they discuss the strengths and weaknesses of the papers. The groups are given a description of a particular topic and instructed to choose which of the papers

presented they would cite when writing a paper on this topic. After this activity students will be able to both critically read and evaluate the relative importance of papers to predetermined topics.

↗

###### d. Discussion of papers on a similar topic (Evaluative focus)

In this small group activity for advanced students, students each read a different paper on the same topic. In a group they discuss the strengths and weaknesses of the papers and decide which they would publish and why, as though they were the editorial team of a journal. After this activity students will be able to read, critically evaluate, and review the contents and merits of a scientific paper.

# Writing Enriched Curriculum in EEB

- Challenges of WEC for EEB
  - time intensive process
    - necessary for our department?
  - concern about assignments becoming too prescriptive
  - sustaining interest/engagement over the long term
    - external rating (ongoing)
    - graduate training (in development)

# Writing Enriched Curriculum in EEB

- Benefits of WEC for EEB
  - generated discussion, engagement, and a community focused on writing instruction
  - writing instruction embraced as part and parcel of discipline
  - many findings transferable to other departments

END