How Information Works

A Tool for Understanding Growth in Information Use

In both actions and attitudes, and for each of these ideas separately, a researcher moves along a continuum from novice to expert.

- Their path to Expert Information User is just as convoluted and recursive as the research they are doing.
- Many concepts belong to more than one Frame, and they impact each other.
- It is often hard, but not really important, to say which ideas should go where.

The expert understands these connections.

Each Frame is here interpreted in lay language and includes a "Gateway Scale": an intermediate step between the Frames and an actual assessment rubric. Faculty can place their learning objectives on these Scales to clarify the difficulty level of their assignments. If desired, they can then go on to write assessment rubrics that make sense in their field.

Frame 1: Authority Is Constructed and Contextual

Who we trust as an expert depends on why we need the information & who's doing the trusting.

Authority exists because a community gives it to someone. Beware: sometimes authority comes mostly from "privilege" that can drown out other voices.

Good thinkers consider information skeptically, but keep an open mind.

An expert can use any medium to communicate their ideas. Information is increasingly built socially, and formats will continue to change.

Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Use standards given to them by others to make judgements • Repackage the ideas of others	• Believe a specific number of sources will answer the question • Think in black and white
⬇ Transitional Phase ⬇		
Able – Knowledgeable (Junior/Senior)	• Apply basic standards of the field to experts as well as information • Seek nonstandard sources • Use field expertise to synthesize and share knowledge from many, even unique, sources	• Respect that field has some measures of truth to lean on • Accept that even authorities in the field disagree sometimes; that is how knowledge grows
⬇ Transitional Phase ⬇		
Skilled – Experienced (Graduate/Expert)	• Recognize other markers of quality from experience • Know they have a voice, too -- and take responsibility for their influence on others • Become the expert others quote. Easily think and question across disciplines	• Understand even authorities disagree, information about a topic can be infinite -- & come to love that challenge • Constantly challenge their own biases

Frame 2: Information Creation is a Process

The way information is shared changes the way it is created, and vice versa.

Good information can come in any format. Every format has its benefits and drawbacks, including assumptions about quality and authority that may or may not be true.

Formats are changing fast, and researchers have to keep up with how these new formats work so they can understand the information that comes out of them.

Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Tend to trust known formats • Create in traditional and pre-identified formats	• Believe format equals authority • Are unaware of many formats for information
⬇ **Transitional Phase** ⬇		
Able – Knowledgeable (Junior/Senior)	• Identify potential formats that are appropriate to the topic or assignment • Use many less common formats, i.e. primary sources, social media, and others	• Understand traditional processes of information creation • Willing to explore formats for further research and presentation • Curious about applying formats to research
⬇ **Transitional Phase** ⬇		
Skilled – Experienced (Graduate/Expert)	• Create new media, and watch how that changes meaning and purpose – and their responsibility for its uses • Investigate the wide range of unusual places to find good information	• Know formats can be forged, or unusual formats can allow breakthroughs • Embrace ambiguity of all knowledge

Frame 3: Information has value

Information is worth money. It can be bought and sold.

It is valuable because seekers learn from it & use it to influence others.

Economic, legal, and social forces influence how it is created, used, packaged & traded.

Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Do not consider security or privacy on the internet • Have trouble distinguishing research from advertising	• See themselves as only consumers of information • Underestimate the time and skill that goes into creating a product • Believe everyone has equal access to information
⬇ **Transitional Phase** ⬇		
Able – Knowledgeable (Junior/Senior)	• Protect their own intellectual property • Watch for the impact of commercial interests on research	• Begin to see themselves as producers, too • Clearly understand that time is money, even for information • Understand many social forces that limit expression of some groups of people
⬇ **Transitional Phase** ⬇		
Skilled – Experienced (Graduate/Expert)	• Recognize how ideas morph from user to user and can exploit the process • Change what they do online because they know their personal information is a commodity • Make strategic, value decisions about publishing, understanding that the market is skewed and flawed	• See themselves as powerful producers of information • Highly value the time and work required to produce good information

Frame 4: Research is Inquiry

Research is seldom a straight line with an answer at the end. It is a spiral of deeper questions that arise as understanding grows.

The more a researcher works, the more skill and perspective they gain about the process

Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Ask simple questions and expect to use one skill/resource to find an answer • Use a few, convenient sources to report on findings	• Believe there is an easy, simple answer and that they know - or should know - how to find it
⬇ Transitional Phase ⬇		
Able – Knowledgeable (Junior/Senior)	• Make connections and distinctions between broad, relevant ideas and specific research questions • Spend time investigating a simple question to better understand gaps and conflicts before imagining their own research question • Assemble a wide range of sources, and discern what's useful / reliable and what's not • Integrate those sources as supporting evidence	• Appreciate that many problems don't have straightforward solutions • Understand that there are different methods of inquiry, in many different fields of study
⬇ Transitional Phase ⬇		
Skilled – Experienced (Graduate/Expert)	• Ask surprising, complex, difficult questions that may not have an answer • Break down complex inquiries into many small tasks, and use many different skills on each task • Combine many different sources to solve a hard problem • Make novel conclusions that reach beyond the data • Collaborate with colleagues; nurture other researchers	• Enjoy the exploration and ambiguity of research • Admit when they are wrong

Frame 5: Scholarship is a Conversation

Researchers talk to one another, even across the centuries, gathering new ideas into old questions. The interplay creates new things. There may be many answers to a single question.

A researcher may have to earn the right / learn the rules to speak in a given conversation, depending on who / what is already "in the room." It might not be fair.

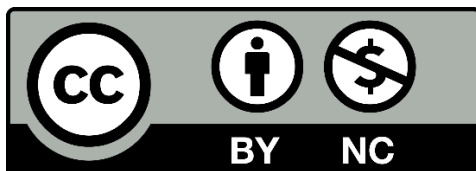| Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Have a hard time finding where they may join the conversation • Do not recognize the jargon and rules of the discipline • Can discuss at least one idea seminal to the discipline, and set it in its timeframe • Cite basic formats when quoting directly	• Quickly judge an argument • Think of the conversation as having a correct, absolute end (black and white thinking) • Believe that citing correctly is busy work
⬇ **Transitional Phase** ⬇		
Able – Knowledgeable (Junior/Senior)	• Join the conversation, limited by lack of experience and context • Use most of the rules and jargon of discipline • Can connect and explain major arguments/theories/ideas of the field • Cite most formats of content correctly, and where needed	• Judge the argument after careful questioning • Accept that the conversation is complex, but may not quite grasp the scope and context
⬇ **Transitional Phase** ⬇		
Skilled – Experienced (Graduate/Expert)	• Use the subtleties of different venues to tell the right story in the right place at the right time • Create and continue the conversation • Speak the jargon fluently • Cite effortlessly and are cited by others • Seek out and support other voices; listen	• Suspend judgement until they understand the entire context • Understand that conversations are ongoing • Conceive the scope of information in the field, and the place of every argument across time

Frame 6: Searching is Strategic

Searching is a skill set: search mechanics matter.

The mental flexibility to ask a question in many different ways of many different kinds of sources - and learn as you go – is also necessary.

Who you are affects how you search. Learn to stretch.

Level	Actions / Skills	Attitudes
Novice – Aware (First Year/Sophomore)	• Use a single information source, often Google, in one way • Often lost in the process, confused by options	• Have little to no patience for research and for the time it takes • Believe they can do it themselves, without help or input
⬇ Transitional Phase ⬇		
Able – Knowledgeable (Junior/Senior)	• Explore and incorporate additional sources of information, moving beyond Google and conduct more intermediate searches • Ask for help as needed, and value the input and expertise of others	• Recognize and appreciate the time required to conduct research • Believe there are always more places to look
⬇ Transitional Phase ⬇		
Skilled – Experienced (Graduate/Expert)	• Consider many sources. Analyze and evaluate their strengths and weaknesses, and chose the most efficient / effective • Use the specifics of the research question, circumstance, and need to select the appropriate searching method • Manipulate search engines skillfully • Humbly seek – and provide – help where needed	• Enjoy the research process • Ask for and provide help when and if needed • Exhibit tenacity, organization, flexibility, humility, and serendipity