Designing for Difficulty: Social Pedagogies as a Framework for Enhancing Student Learning

Randy Bass,
Georgetown University (U.S.A.)

University of Queensland
November 5, 2009

http://tinyurl.com/socialpedagogiesUQ

In collaboration with Heidi Elmendorf, Georgetown University, Co-PI, Social Pedagogies Project; funding by the Teagle Foundation

Sir Ken Robinson, “How Education Kills Creativity”

TED Ideas worth spreading

ted.com

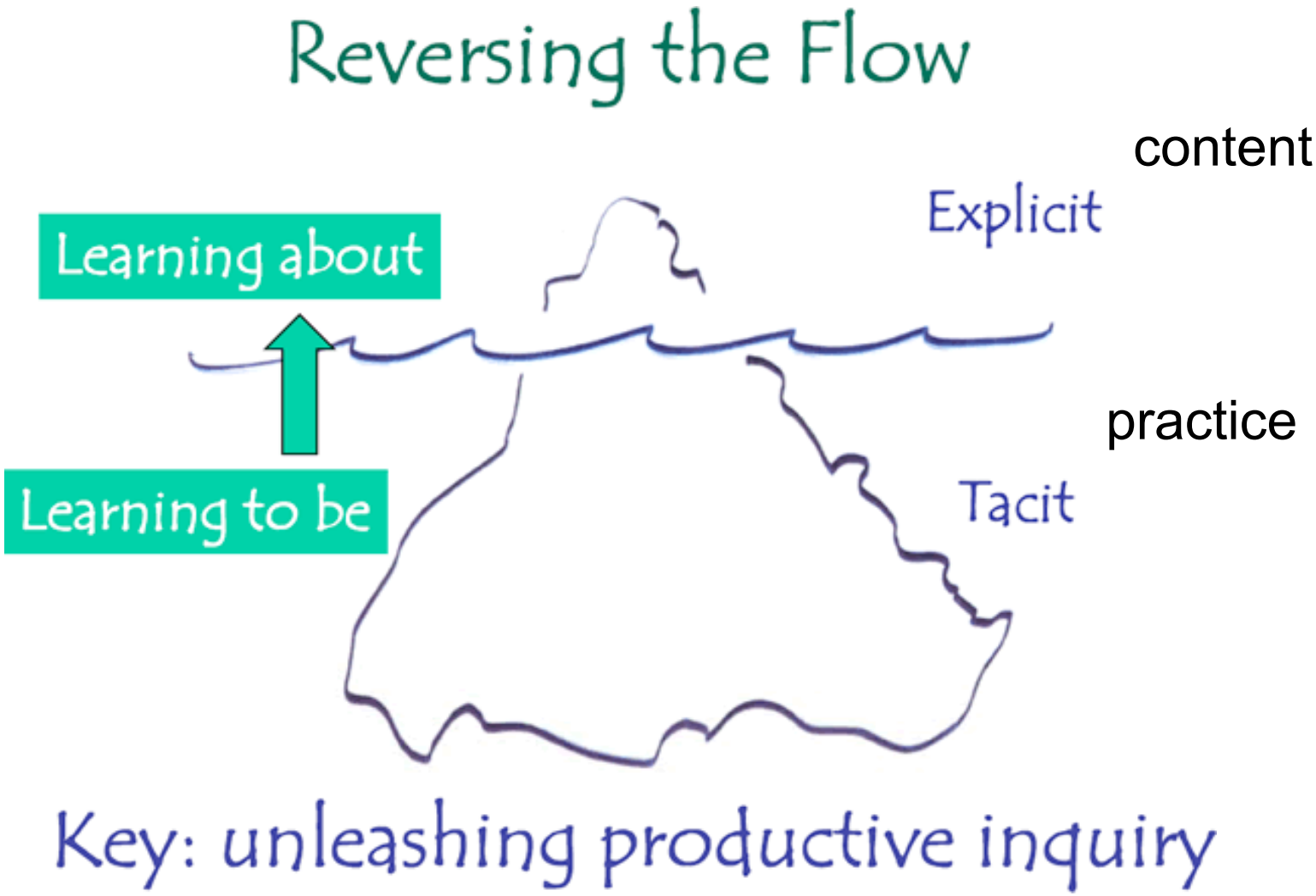
Sir Ken Robinson, “How Education Kills Creativity”

“What we need is a new conception of human ecology, one in which we start to reconstitute our conception of the richness of human capacity.”

TED Ideas worth spreading

ted.com

John Seely Brown: Practice to Content



Driving questions

How do we make formal learning environments more like informal learning?

How do we make classroom learning more like participatory culture?

Driving questions

How do we make classroom learning more like participatory culture?

- Features of participatory culture
  - Low barriers to entry
  - Strong support for sharing one's contributions
  - Informal mentorship, experienced to novice
  - Members feel a sense of connection to each other
  - Students feel a sense of ownership of what is being created
  - Strong collective sense that something is at stake

Jenkins, et. al., The Challege of Participatory Culture

Driving questions

How do we make formal learning environments more like informal learning?

How do we make classroom learning more like participatory culture?

How do we go about *designing* for that kind of experience?

In what ways do we have to rethink our pedagogical and assessment practices to make that kind of learning effective?

What new dimensions of learning demand our attention?

Visible Knowledge Project Findings

Capturing the Visible Evidence of Invisible Learning

Posted January 7th, 2009 by Randy Bass and Bret Eynon
0 Comments | 1743 Page Views

This is a portrait of the new shape of learning with digital media, drawn around three core concepts: adaptive expertise, embodied learning, and socially situated pedagogies. These findings emerge from the classroom case studies of the Visible Knowledge Project, a six-year project engaging almost 70 faculty from 21 different institutions across higher education. Examining the scholarly work of VKP faculty across practices and technologies, it highlights key conceptual findings and their implications for pedagogical design. Where any single classroom case study yields a snapshot of practice and insight, collectively these studies present a framework that bridges from Web 1.0 to Web 2.0 technologies, building on many dimensions of learning that have previously been undervalued if not invisible in higher education.

Login or register to post comments | Read more

- Academiccommons.org

Visible Knowledge Project Findings

- **Adaptive expertise**: if you want to cultivate "flexible performance" with knowledge and "judgment in uncertainty" then you have to pay attention to intermediate thinking processes. You have to provide ways to capture student work processes in addition to summative assessments. Important stuff may be on the cutting room floor.

- **Embodied pedagogies**: rich intellectual capacities are not just cognitive; new media pedagogies are not distancing and impersonal, but engaging of creativity, affect, intuition. The more authentic the learning situation the more expansive the dimensions of learning.

- **Socially situated pedagogies**: learning with new media is fundamentally social; new media pedagogies can situate learning in intellectual communities that reach beyond the classroom.

Definition: Social Pedagogies

- Social Pedagogies are design approaches for teaching and learning that are communication-intensive, strive to build and work with a sense of intellectual community, and seek to bridge disciplinary understanding with broader contexts for learning.

- Social pedagogies build in iterative cycles of engagement with the most difficult material, not just as content but through ways of thinking, ways of acting, ways of communicating.

Randy Bass and Heidi Elmendorf (Funded by the Teagle Foundation, 2007)

Definition

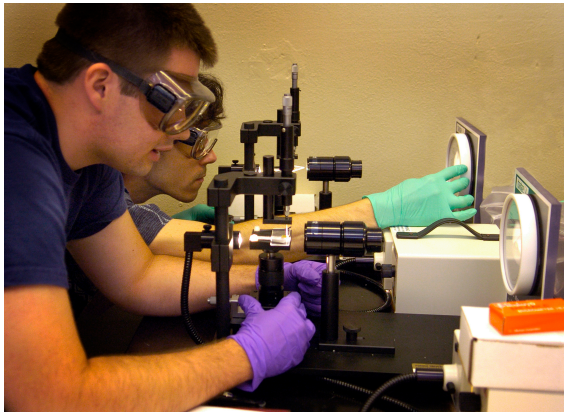
- We recognize that most faculty have communication elements in their courses; the major premise of this work is that *the act of representing knowledge to others* becomes a central design point to the pedagogy.

- With social pedagogies, the representation of knowledge for others is intrinsic to deepening understanding, not just for the purpose of presenting a product that represents their learning at the end.

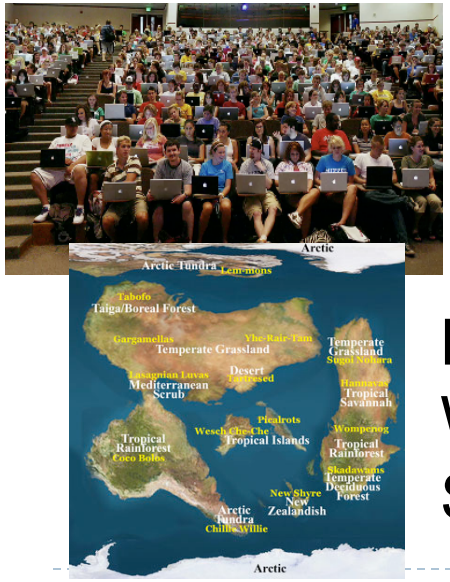
Randy Bass and Heidi Elmendorf (Funded by the Teagle Foundation, 2007)

Range of social pedagogies

Large enrollment courses designed as inquiry-based & participatory

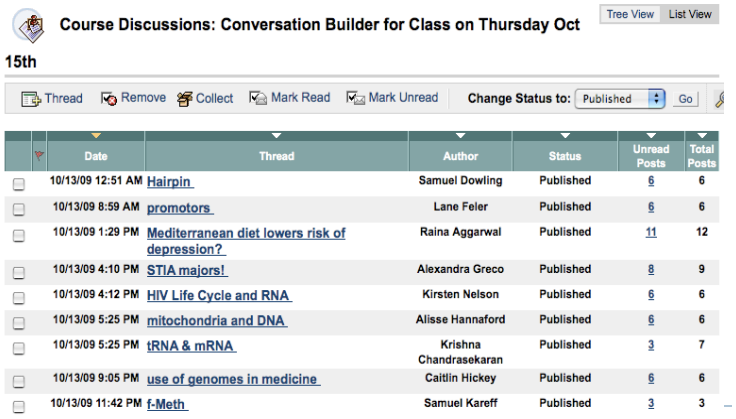


CASPiE



Michael Wesch, World History Simulation

Using social tools at scale



Course Discussions: Conversation Builder for Class on Thursday Oct 15th

Tree View | List View

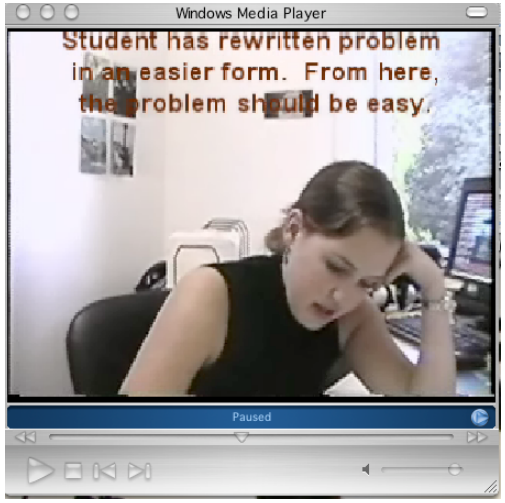
Thread | Remove | Collect | Mark Read | Mark Unread | Change Status to: Published | Go

Date	Thread	Author	Status	Unread Posts	Total Posts
10/13/09 12:51 AM	Hairpin	Samuel Dowling	Published	6	6
10/13/09 8:59 AM	promotors	Lane Feler	Published	6	6
10/13/09 1:29 PM	Mediterranean diet lowers risk of depression?	Raina Aggarwal	Published	11	12
10/13/09 4:10 PM	STIA majors!	Alexandra Greco	Published	8	9
10/13/09 4:12 PM	HIV Life Cycle and RNA	Kirsten Nelson	Published	6	6
10/13/09 5:25 PM	mitochondria and DNA	Alisse Hannaford	Published	6	6
10/13/09 5:25 PM	tRNA & mRNA	Krishna Chandrasekaran	Published	3	7
10/13/09 9:05 PM	use of genomes in medicine	Caitlin Hickey	Published	6	6
10/13/09 11:42 PM	f-Meth	Samuel Kareff	Published	3	3

Range of social pedagogies

Smaller courses that stress social learning, public products, and intellectual community

Digital stories



Use of video "think alouds" to teach students problem solving in Calculus

Reacting to the Past (role playing simulation)

Range of social pedagogies

Activities that link curricular and extracurricular learning

Weblogs while studying abroad

Electronic portfolios

Biology Teaching Thesis

Some Provisional Claims

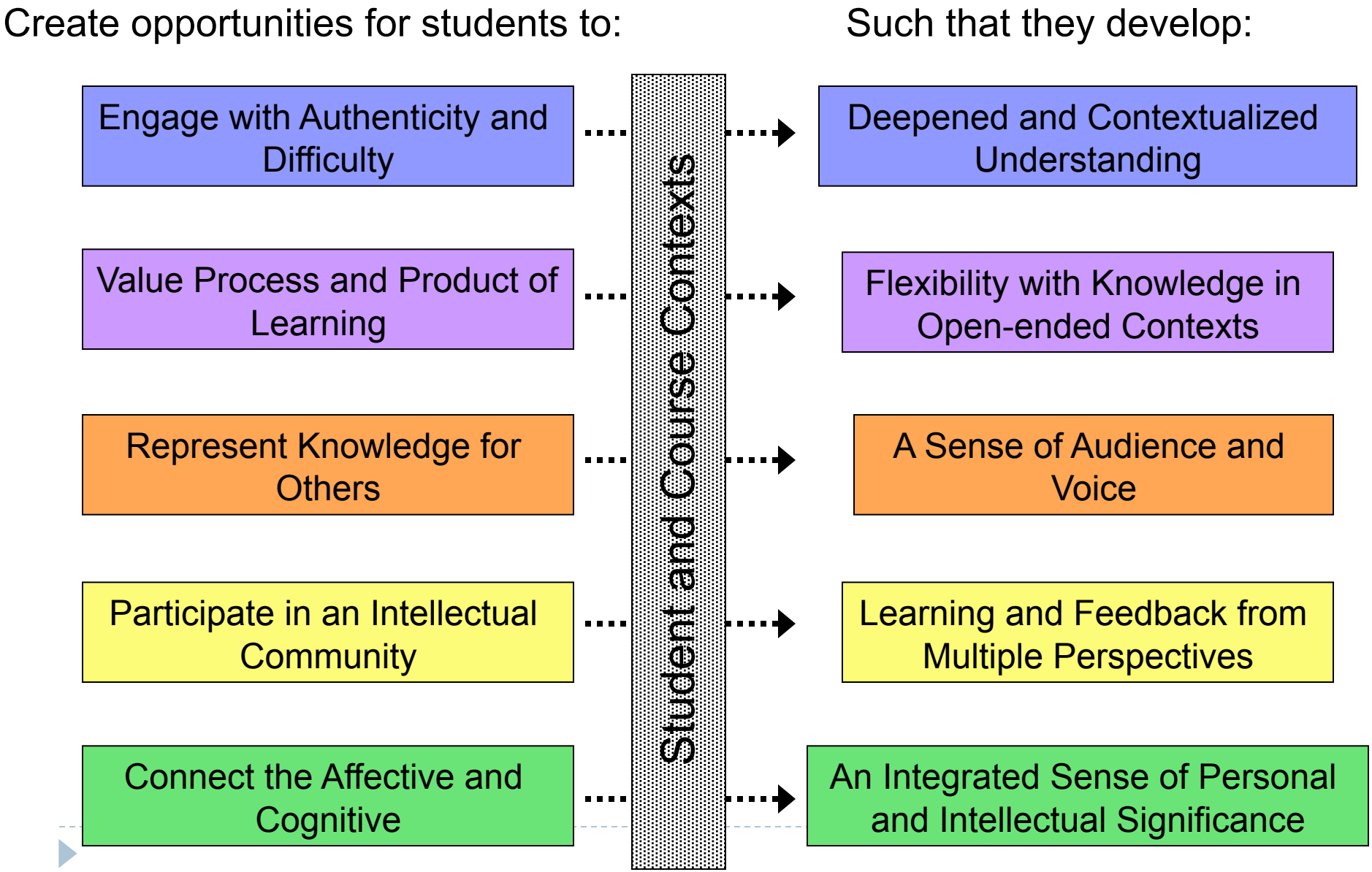
- Social pedagogies are particularly effective at engaging students with the difficult dimensions of core (threshold) concepts.

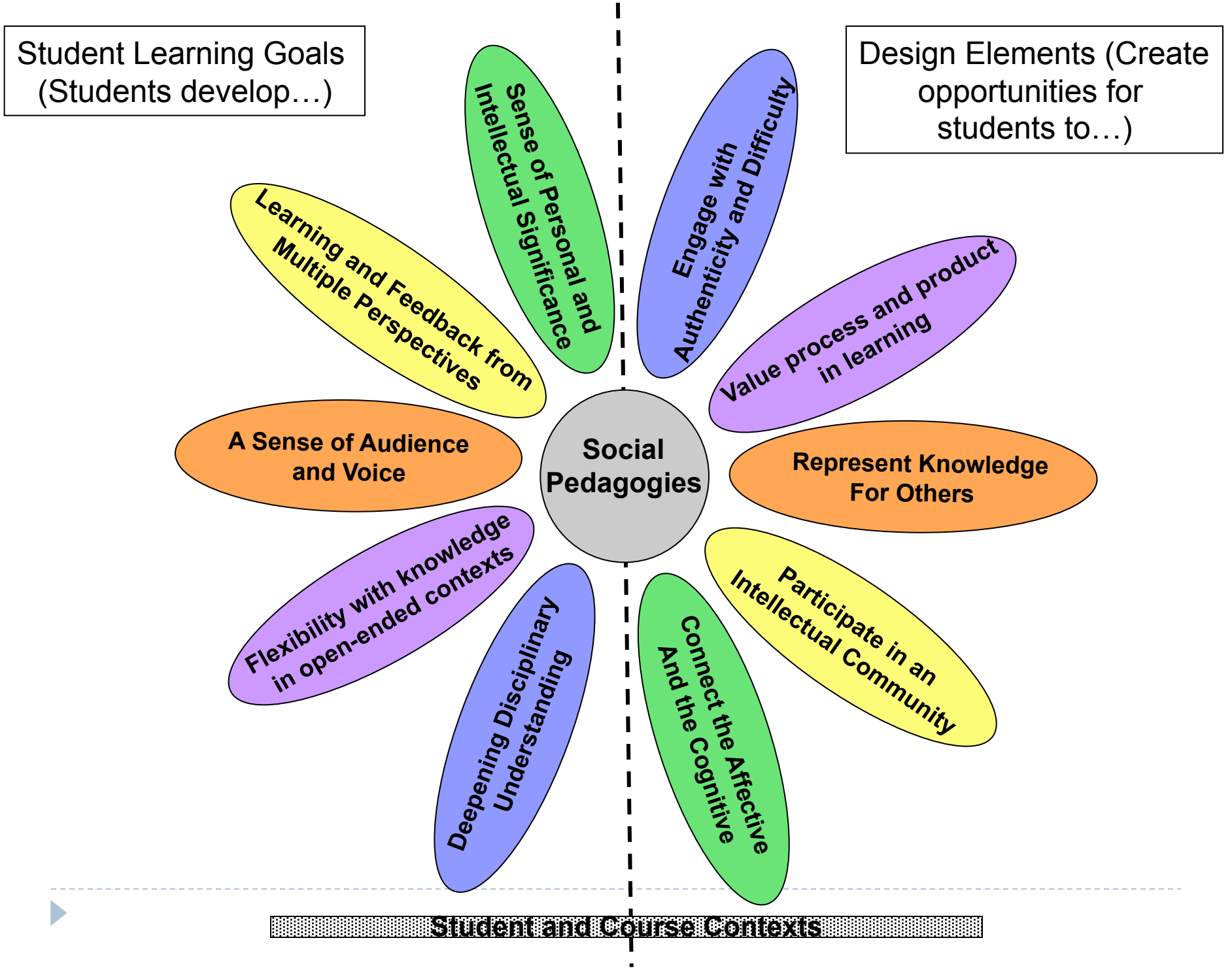
- Social pedagogies bridge disciplinary understanding with embodied dimensions of learning.

- Social pedagogies open up a set of filters or conditions for student learning–such as prior knowledge, identity, uncertainty, "troublesome knowledge"–that can be ignored or suppressed through more bounded, traditional pedagogies.

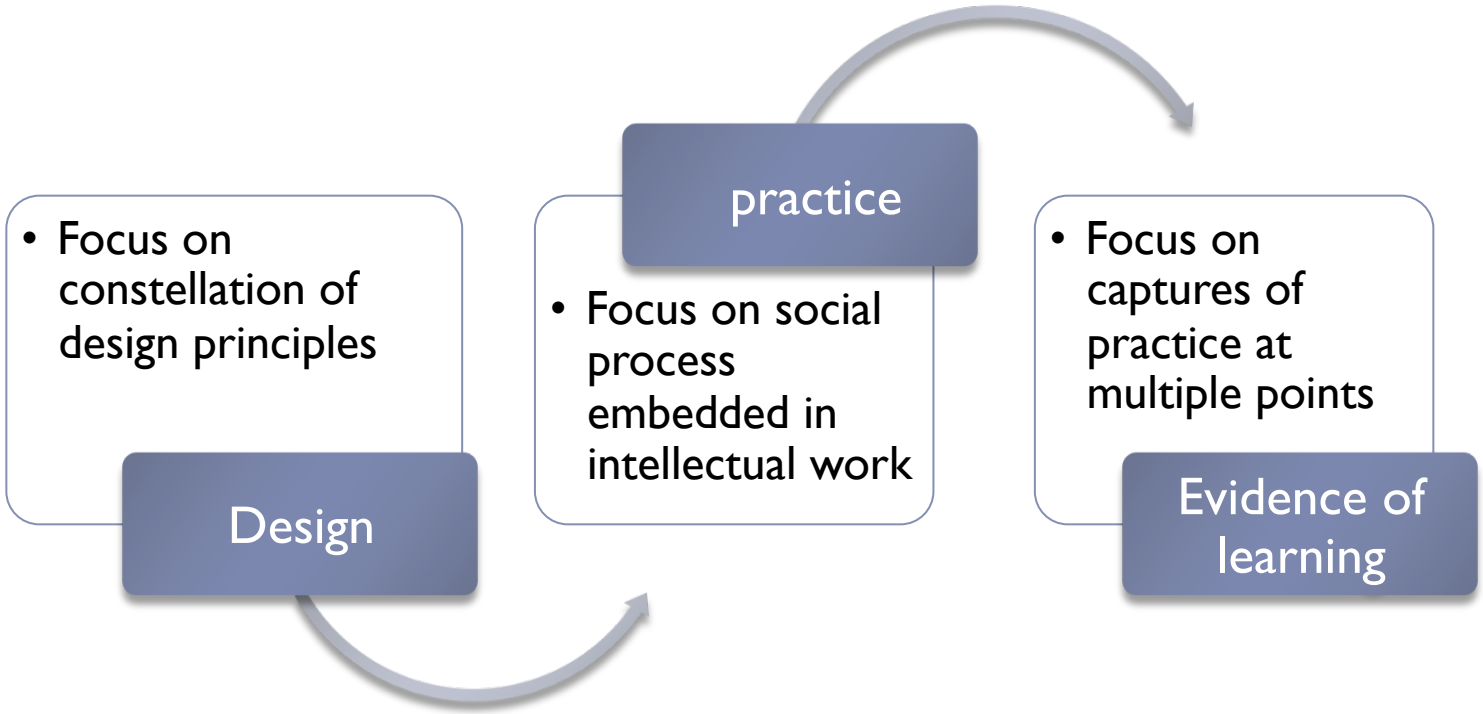
Randy Bass and Heidi Elmendorf (Funded by the Teagle Foundation, 2007)

Social Pedagogies



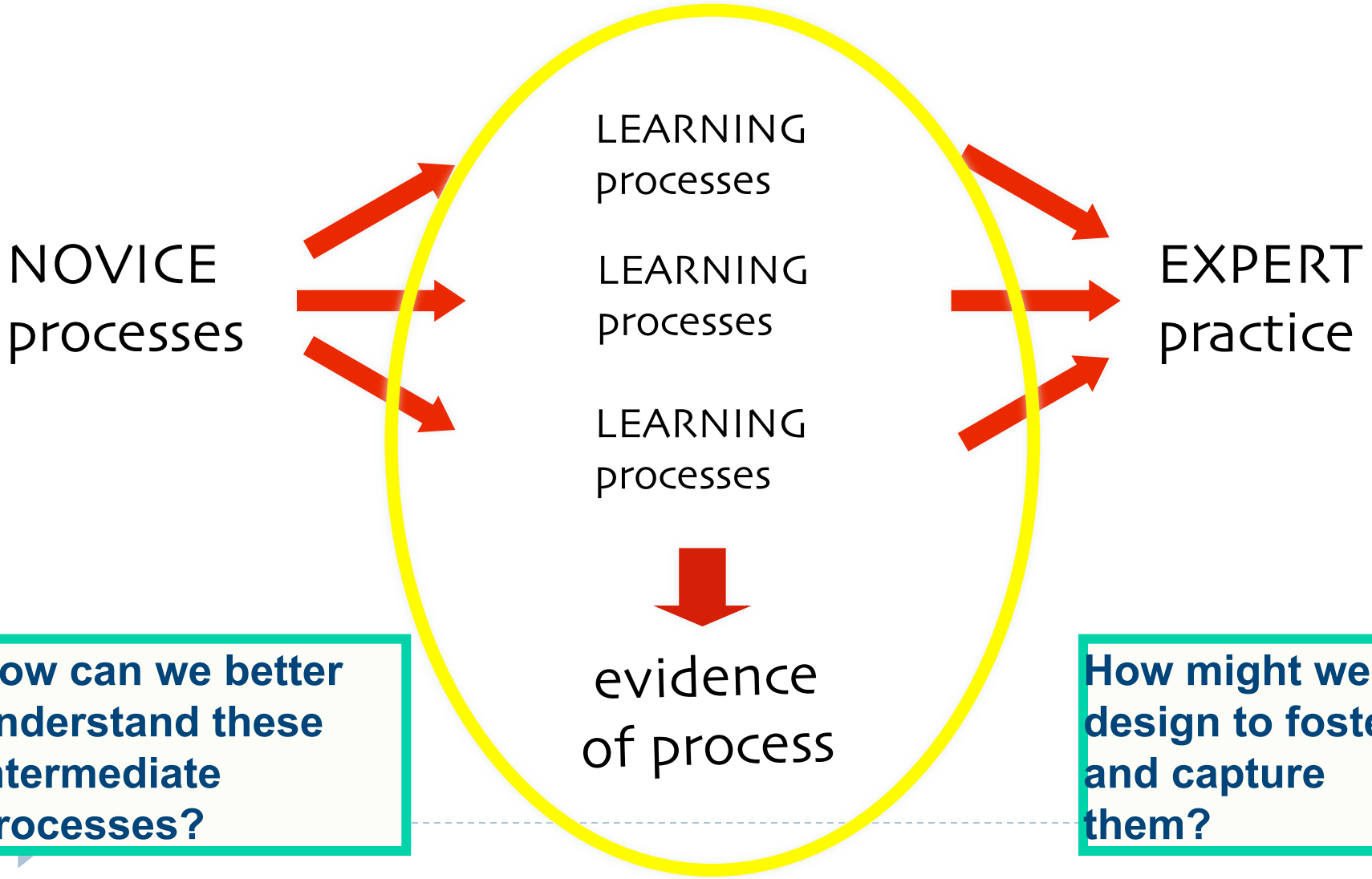

Student Learning Goals (Students develop…)
Design Elements (Create opportunities for students to…)
Sense of Personal and Intellectual Significance
Engage with Authenticity and Difficulty
Learning and Feedback from Multiple Perspectives
Value process and product in learning
A Sense of Audience and Voice
Social Pedagogies
Represent Knowledge For Others
Flexibility with knowledge in open-ended contexts
Participate in an Intellectual Community
Deepening Disciplinary Understanding
Connect the Affective And the Cognitive
Student and Course Contexts

Key elements: Social Pedagogies

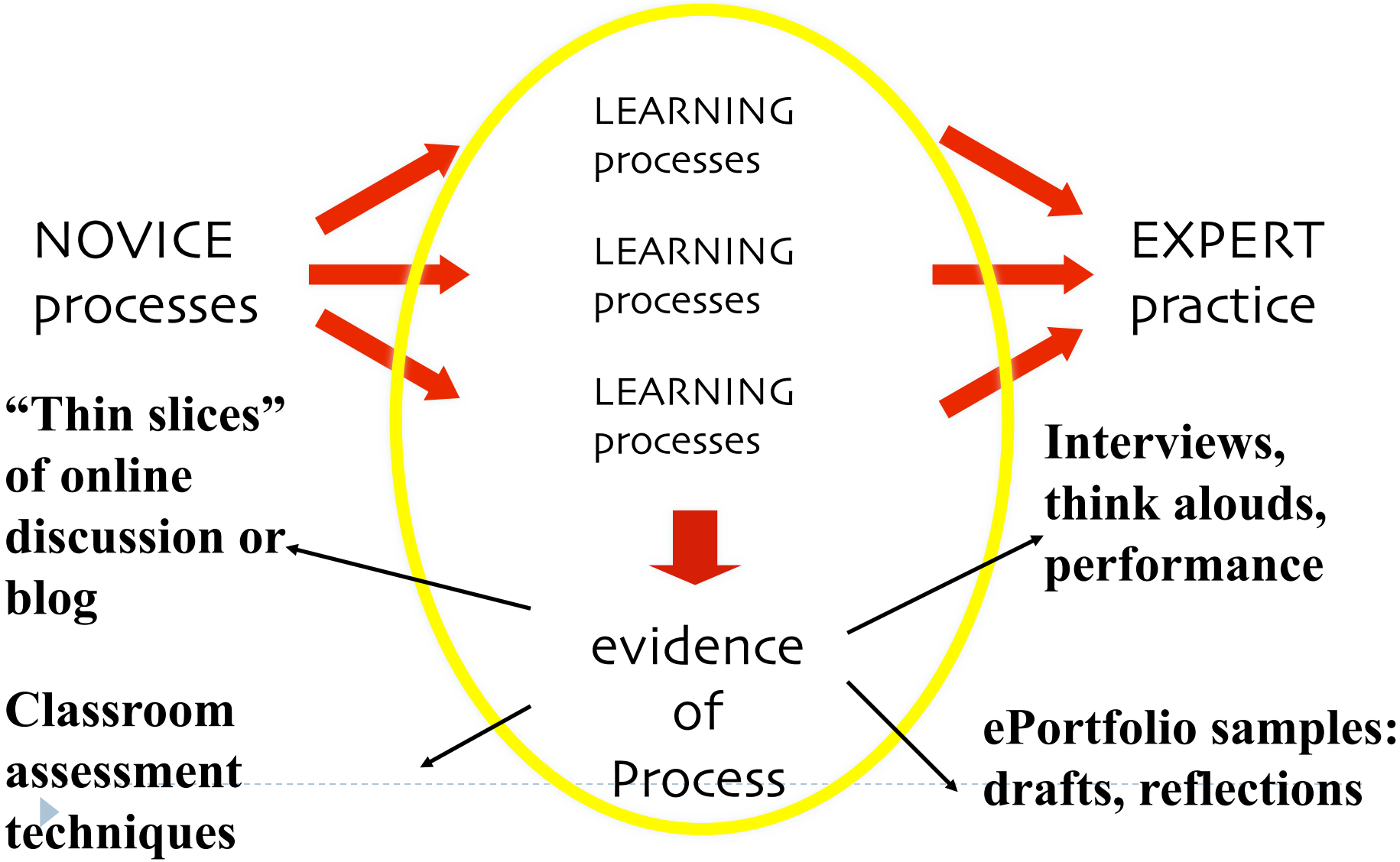


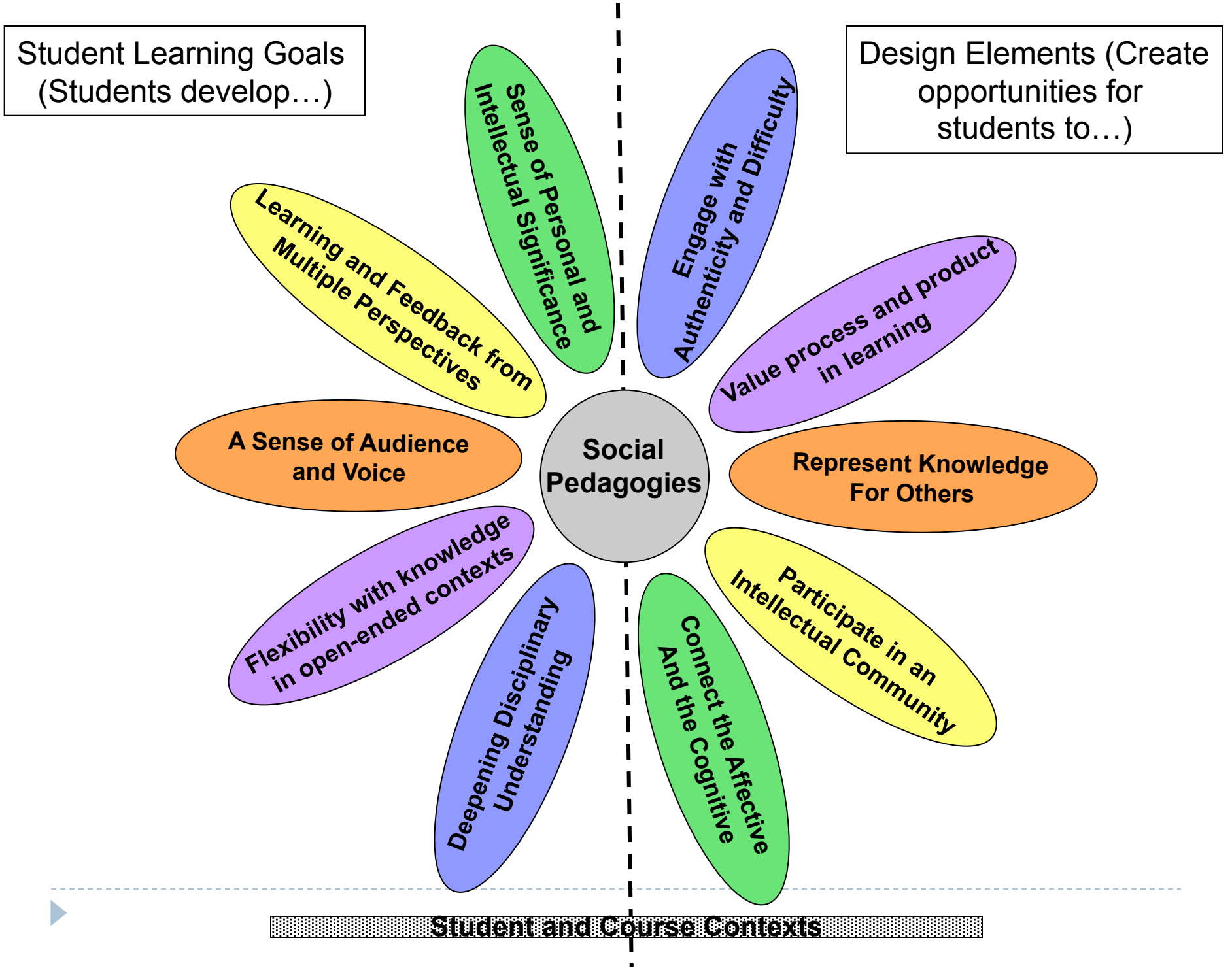
Connecting Intermediate Processes to Practice

Connecting Intermediate Processes to Practice



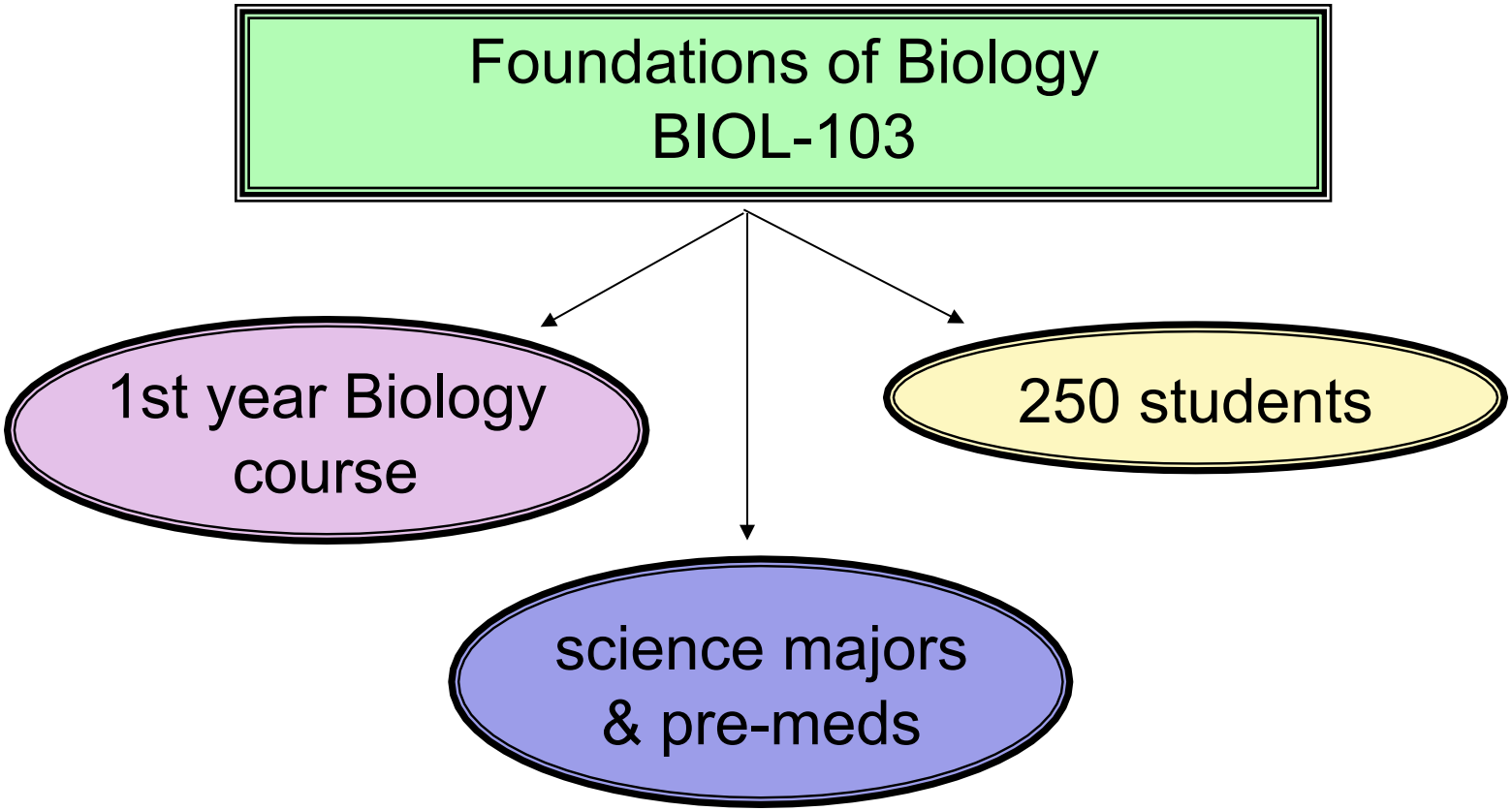
Connecting Intermediate Processes to Practice




Student Learning Goals (Students develop…)
Design Elements (Create opportunities for students to…)
Sense of Personal and Intellectual Significance
Engage with Authenticity and Difficulty
Learning and Feedback from Multiple Perspectives
Value process and product in learning
A Sense of Audience and Voice
Social Pedagogies
Represent Knowledge For Others
Flexibility with knowledge in open-ended contexts
Participate in an Intellectual Community
Deepening Disciplinary Understanding
Connect the Affective And the Cognitive
Student and Course Contexts

#1: Social Pedagogies and a Large Lecture Course

Heidi Elmendorf, Georgetown University

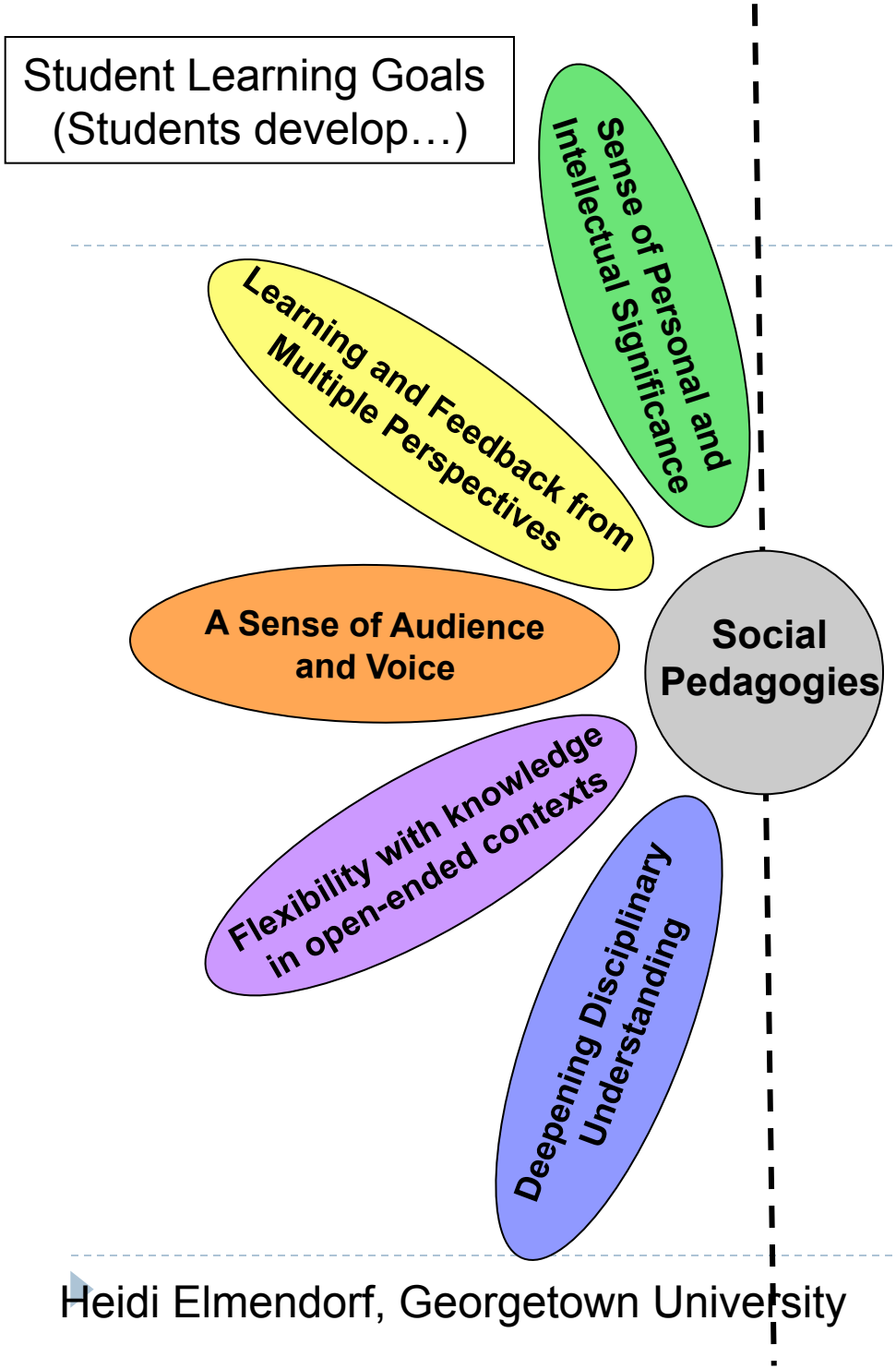


Traditional Course Design Elements

(and evidence of learning)

- Readings
- Class
- Lab and lab reports
- Problem Sets
- Research Paper
- Exams

Heidi Elmendorf, Georgetown University



Social Pedagogy Course Design Elements

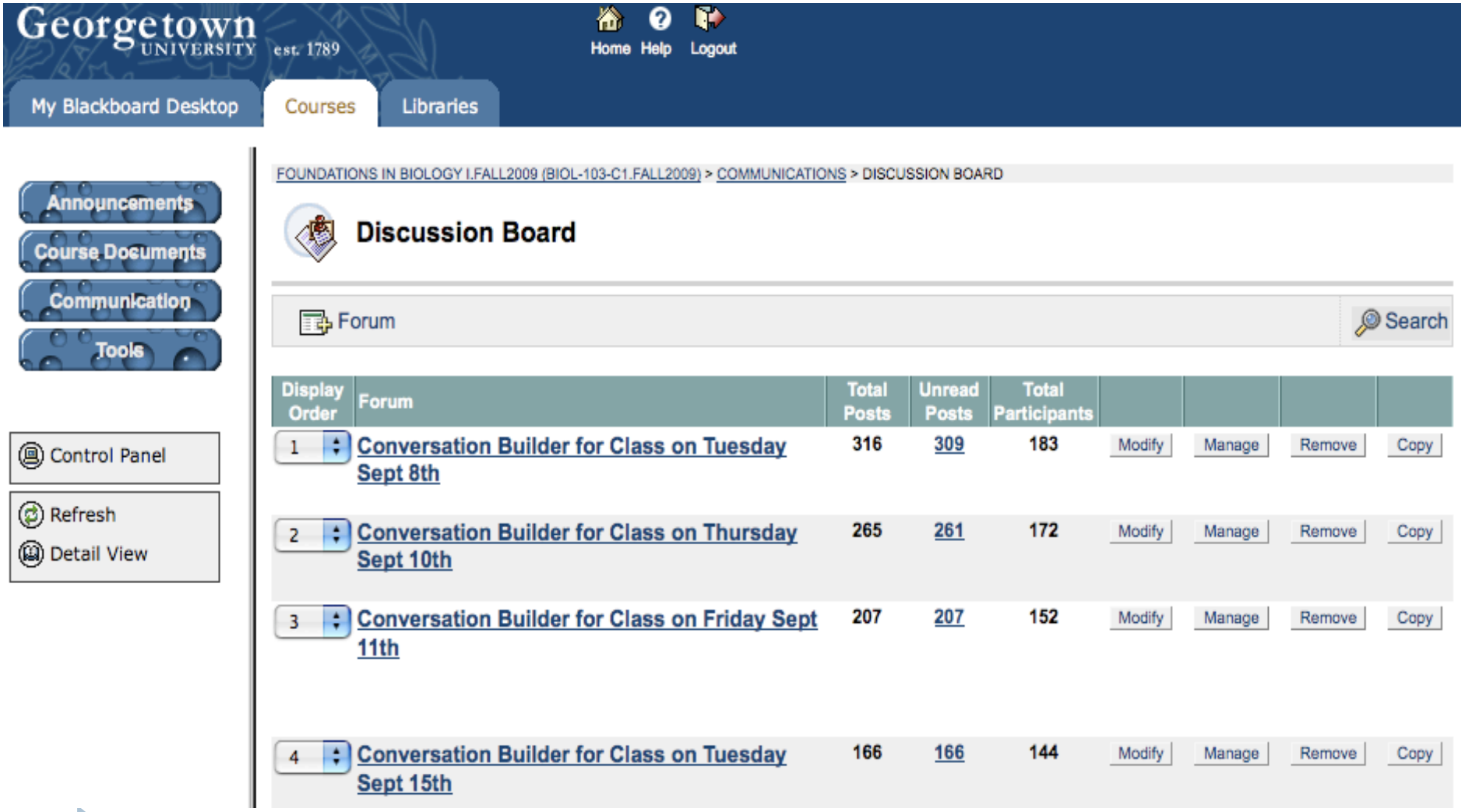
- Readings *& On-line Conversation*
  - Class *& Think-Pair-Share*
  - Lab *& Partnered Inquiry*
- Problem Sets *& Group Effort around Authentic and Challenging Problems*
- Research Paper *& Shared Steps*
  - Exams *& Room for Uncertainty*

Prof Elmendorf's Instructions to her Students for the Discussion Board

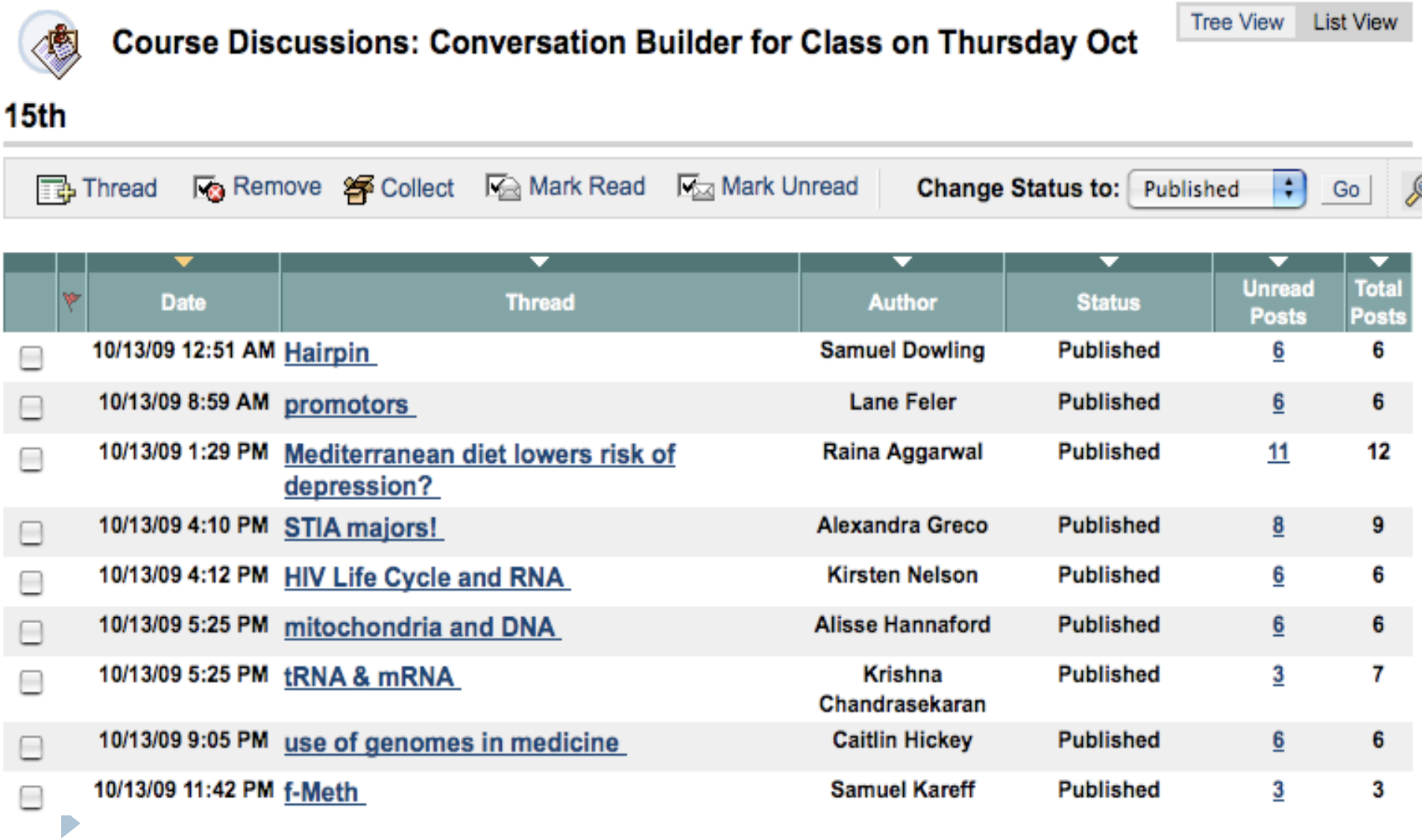
•Communicate about the reading. ***One of the best ways to learn something is to talk about it.*** Air your bafflement, express your wonder, ask your questions, try out a new idea of your own…And while I hope you will talk often about biology this semester with your classmates, I want to be sure you have an official forum for these conversations – and that you are rewarded for the effort you will expend having them.

- We have created ***Discussion Forums on Blackboard*** for each day.
- What should you say? Really… anything. Ask a question, make a connection, pursue an idea beyond the textbook, etc. But most of all – converse! ***Don't just toss out your own ideas. Read what others have already written and be responsive***…
- You must contribute to the conversation by midnight the day before class meets. ***I like to see your conversations before finalizing my class preparation*** …
- These conversations will not be graded. ***You will receive full credit simply for participating.***

Holding Conversations



Holding Conversations



Course Discussions: Conversation Builder for Class on Thursday Oct 15th

Tree View | List View

Thread | Remove | Collect | Mark Read | Mark Unread | Change Status to: Published | Go

	Date	Thread	Author	Status	Unread Posts	Total Posts
☐	10/13/09 12:51 AM	Hairpin	Samuel Dowling	Published	6	6
☐	10/13/09 8:59 AM	promotors	Lane Feler	Published	6	6
☐	10/13/09 1:29 PM	Mediterranean diet lowers risk of depression?	Raina Aggarwal	Published	11	12
☐	10/13/09 4:10 PM	STIA majors!	Alexandra Greco	Published	8	9
☐	10/13/09 4:12 PM	HIV Life Cycle and RNA	Kirsten Nelson	Published	6	6
☐	10/13/09 5:25 PM	mitochondria and DNA	Alisse Hannaford	Published	6	6
☐	10/13/09 5:25 PM	tRNA & mRNA	Krishna Chandrasekaran	Published	3	7
☐	10/13/09 9:05 PM	use of genomes in medicine	Caitlin Hickey	Published	6	6
☐	10/13/09 11:42 PM	f-Meth	Samuel Kareff	Published	3	3

One Conversation

At the end of chapter 15 when talking about codons, the textbook says, "with a few minor exceptions, all codons specify the same amino acids in all organisms."

I was just curious which organisms are these exceptions?

Box 15.1 on page 326 mention some of the exceptions:

"For example, in the single-celled eukaryoutes *Tetrahymena* and *Paramecium*, UAA and UAG code for glutamine instead of stop; and in the year *Candida cylindracea*, CUG codes for serine instead of leucine. In a few species other codons in addition to AUG initiate protein synthesis"

The box is also helpful in explaining why the genetic code is nearly universal with a few minor exceptions.

To add on to this question, the book also says that basically two codons code for each amino acid. Does this suggest a codon and its opposite pair both code for the same amino acid?? What does this mean for genes...

Don't have an answer for anyone, but i was just wondering if anyone could think of an explanation as to why there is only one start codon, yet there are three possible stop codons. What would be the advantage of this difference?

Thanks, this is very helpful... However, can anyone answer the original question?

I just want to say how amazing I think it is that it took a ton of time and effort to put together the table of which codon code for which amino acids and now it is available in every biology textbook. I Just wanted to reflect on how impressive that discovery is.

On that note of how cool this stuff is....as I read, I was amazed by how ordered these processes are (obviously necessarily in order to turn out a living organism, but still). Building blocks seem to lead to other building blocks which lead to yet more building blocks--and everything is important, right down to the reading frame. It really makes me wonder, though, how often things must go wrong, and what the consequences are.

Jose Feito, on the importance of “not knowing”

“The theme of not-knowing [has] emerged as a key factor in the maintenance of a truly collaborative intellectual community within the classroom.

In order for a shared inquiry to proceed productively, the participants must be able to regularly acknowledge their lack of understanding, offer partial understandings, and collectively digest the resulting discourse.

Not-knowing is characterized by a group’s ability to defer meaning, tolerate ambiguity, hold divergent perspectives, and postpone closure. In order to develop, it requires a relatively non-judgmental classroom atmosphere, but not an uncritical one.”

Jose Feito, St. Mary’s University
(Moraga, California, U.S.A.)

Second Conversation

What purpose do noncoding sequences serve? Is it every possible for introns to be changed back into exons and actually expressed genes? What happens to the introns after they are removed?

Also, can someone describe more about how the spliceosome works? How are the exons put together?

I do not believe that the introns are able to be, in a sense, rearranged in order to form a sequence that can code for mRNA because they are degraded immediately after being spliced during the formation of mRNA's.

The spliceosome bends the the introns after attaching the snRNP's to the primary RNA transcript. These ribonucleoproteins are designed to "clump" together in order to cut the intron from the exon and work like a single enzyme to then bind the exons after looping the intron to prepare it for degradation inside the cell.

The book said that introns are degraded back into RNA pieces after they are removed

http://www.youtube.com/watch?v=HSD1AIA1r4Y&feature=related

This video was somewhat helpful visually.

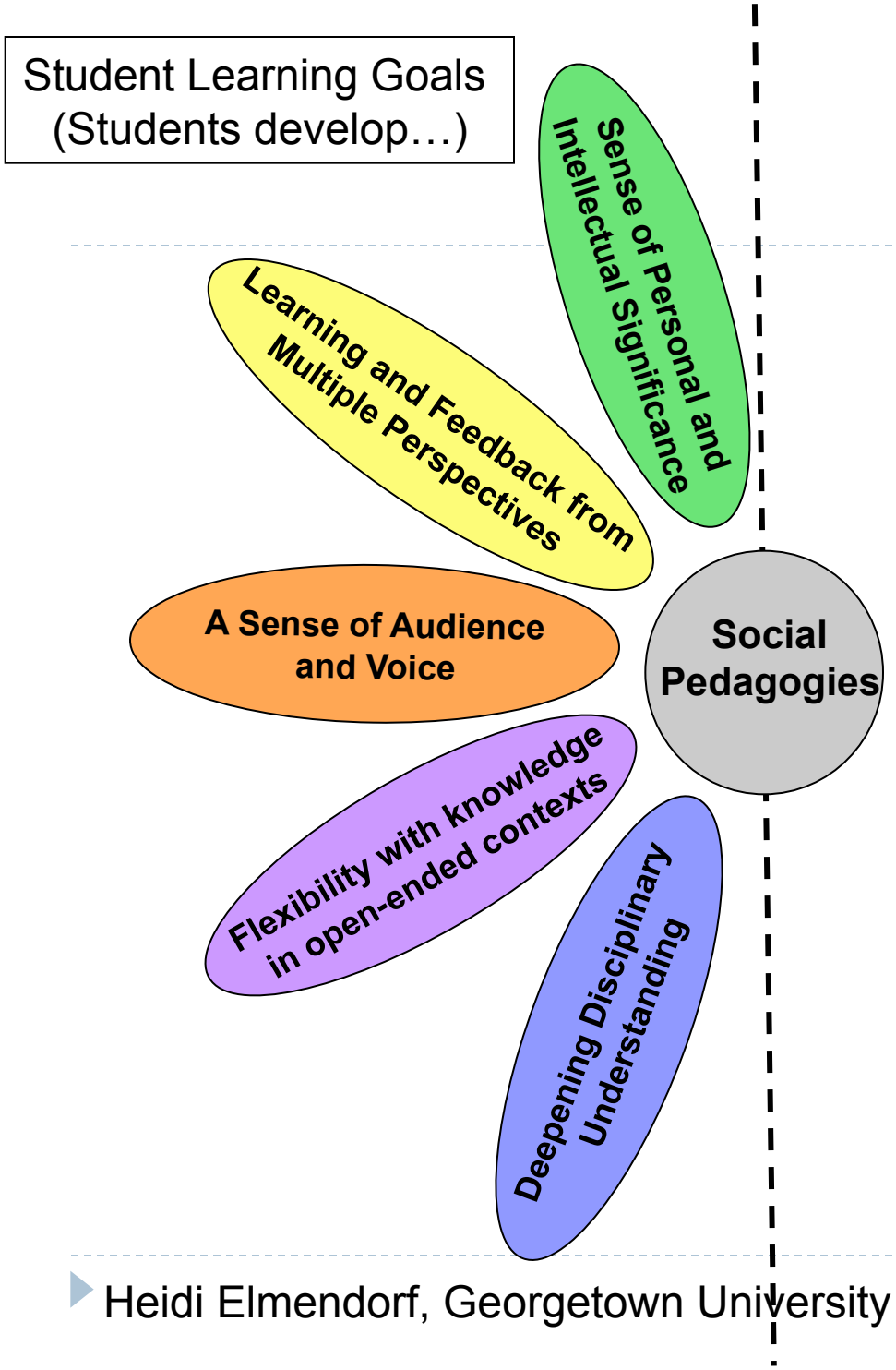
regarding your question on the function of introns, I do not think we actually know what their functions are yet.

It seems to me, though, that they must have some sort of important function that we are not yet aware of. The fact that more complex organisms posses a higher proportion of introns, suggests that they must have some meaning, or some role. Also, why would our bodies put so much energy into making something that just gets thrown out later on? Maybe they used to have a function, but over time, we evolved in such a way that we no longer needed them, and so they are just relics from the past. I don't really know. This would be an interesting research question though.

Thanks, that video was really helpful and showed the whole splicing process really clearly. I agree that introns are degraded right after they're spliced out so they're probably not turned into exons. However, like you guys were saying, I guess it could be possible that introns have some larger function we are unaware of at this point.

This is an interesting point. We seemed to have dismissed/accepted the strange behaviors of introns!

I understand that introns are removed in reference to a certain gene, but is it possible for a segment of DNA to be an intron at one time and an exon at another? Maybe not in a larger genome where there are large gaps between genes, but in smaller genomes where the genes are more crowded together?



Social Pedagogy Course Design Elements

- Readings *& On-line Conversation*
  - Class *& Think-Pair-Share*
  - Lab *& Partnered Inquiry*
- Problem Sets *& Group Effort around Authentic and Challenging Problems*
- Research Paper *& Shared Steps*
  - Exams *& Room for Uncertainty*

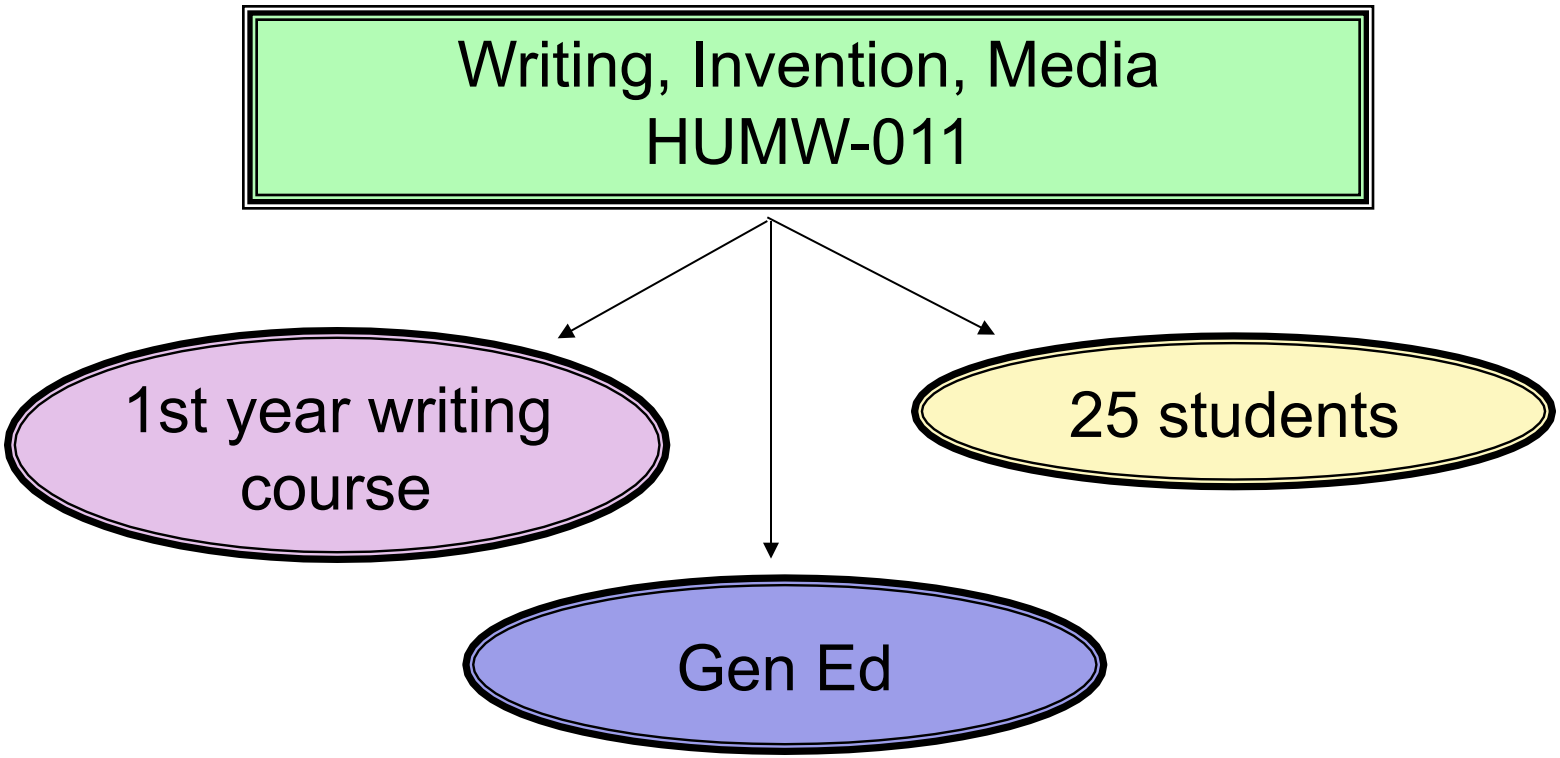
My Surprise…

- The instantaneous community my students formed on-line
- Their expectations of this community
- The quality of their conversations

Belief (w/o formal evidence at the mid-point of this semester) that it is the pervasive social nature of our class - and the authentic challenges they are facing.

Heidi Elmendorf, Georgetown University

Social Pedagogies and an Introductory Writing Class



Randy Bass, Georgetown University

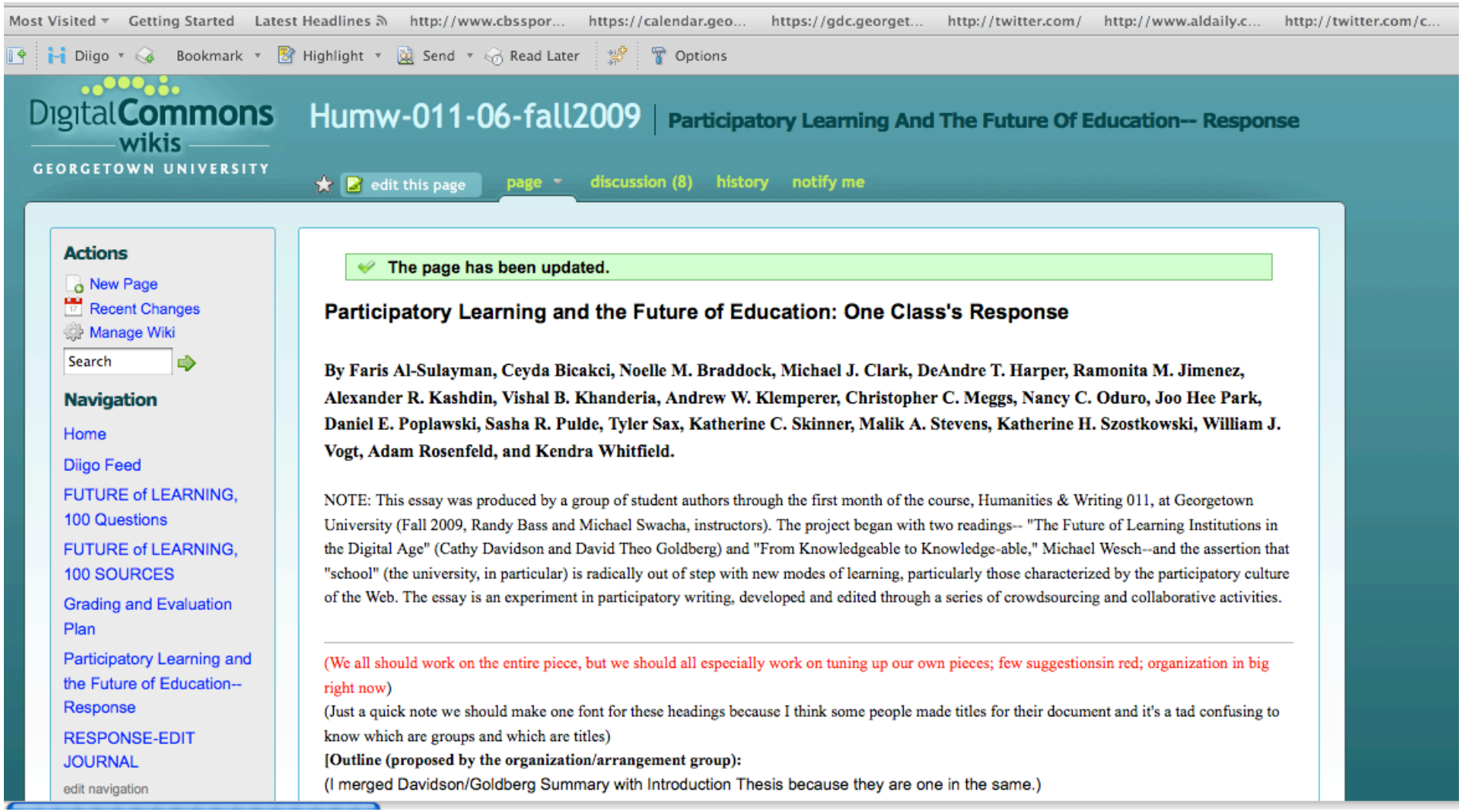
Humanities & Writing 011

- First-year required writing course
- Section theme: "Writing, Invention, Media"
- Core concept: "writing is a social act"
- Core theme: Changes modes of learning, the participatory culture of Web, and the nature of the University
- Assessment through contract, crowd-sourcing (peer rating and aggregation), and professor judgment

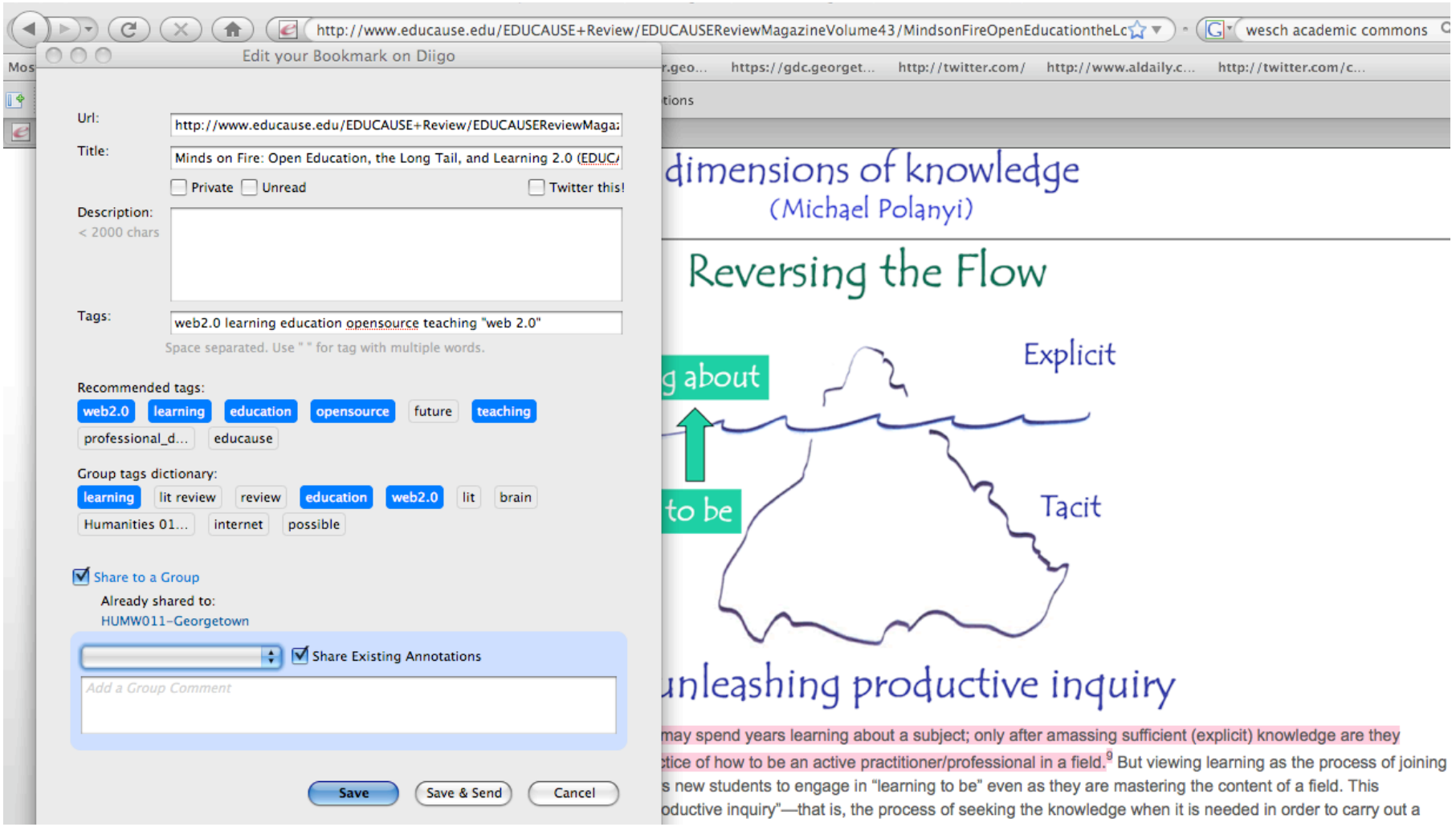
First Project (1-2 months)

- Collectively write an essay responding to the claim that Universities are radically out of step with new modes of learning ("participatory culture") of the Web.
- 20 students acting collectively as "author"
- Write it together through crowd-sourcing and collaborative editing—test the hypothesis that all of them together could write something better than any one of them
- Intent from the beginning is to publish it on the Web

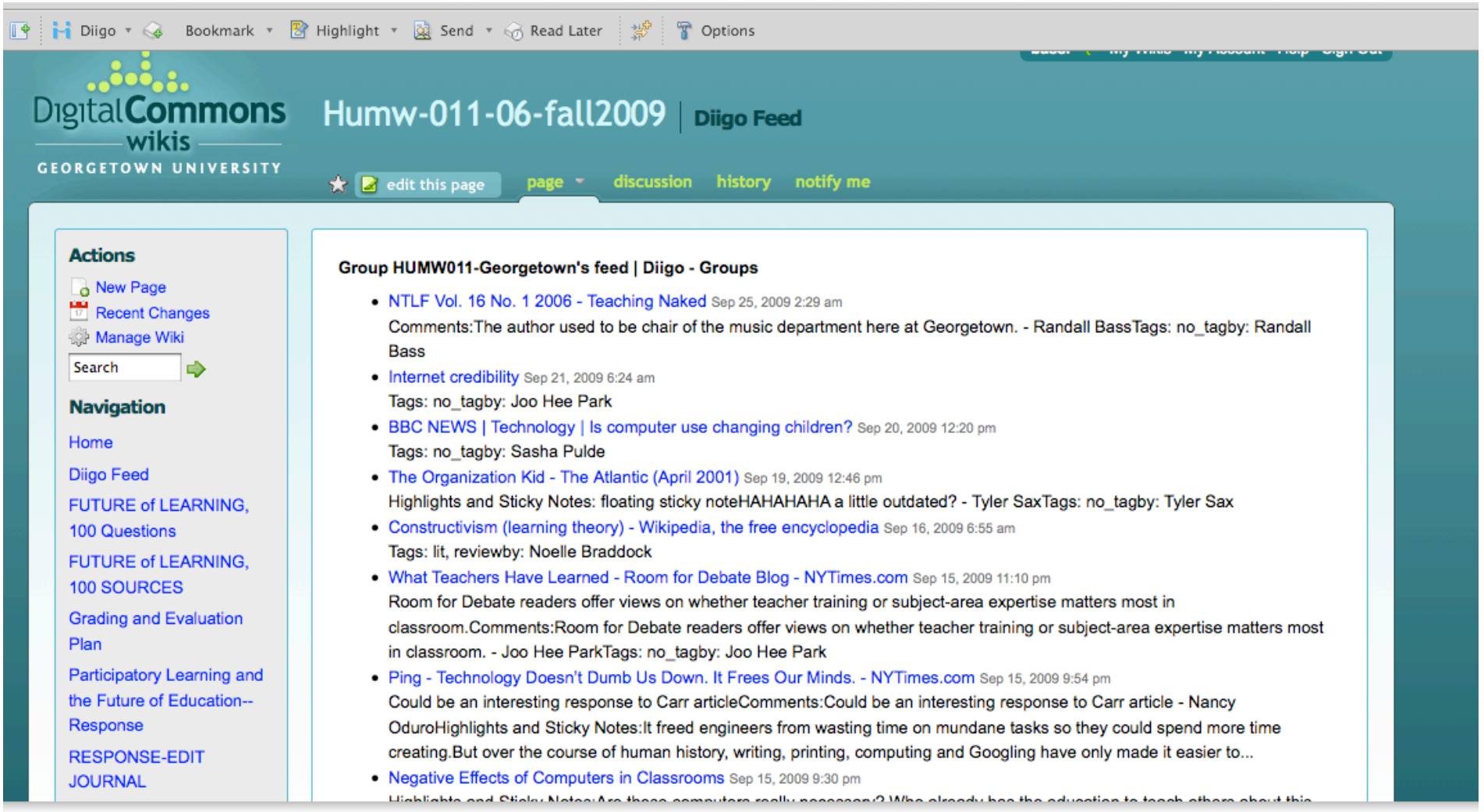
Working in the Wiki



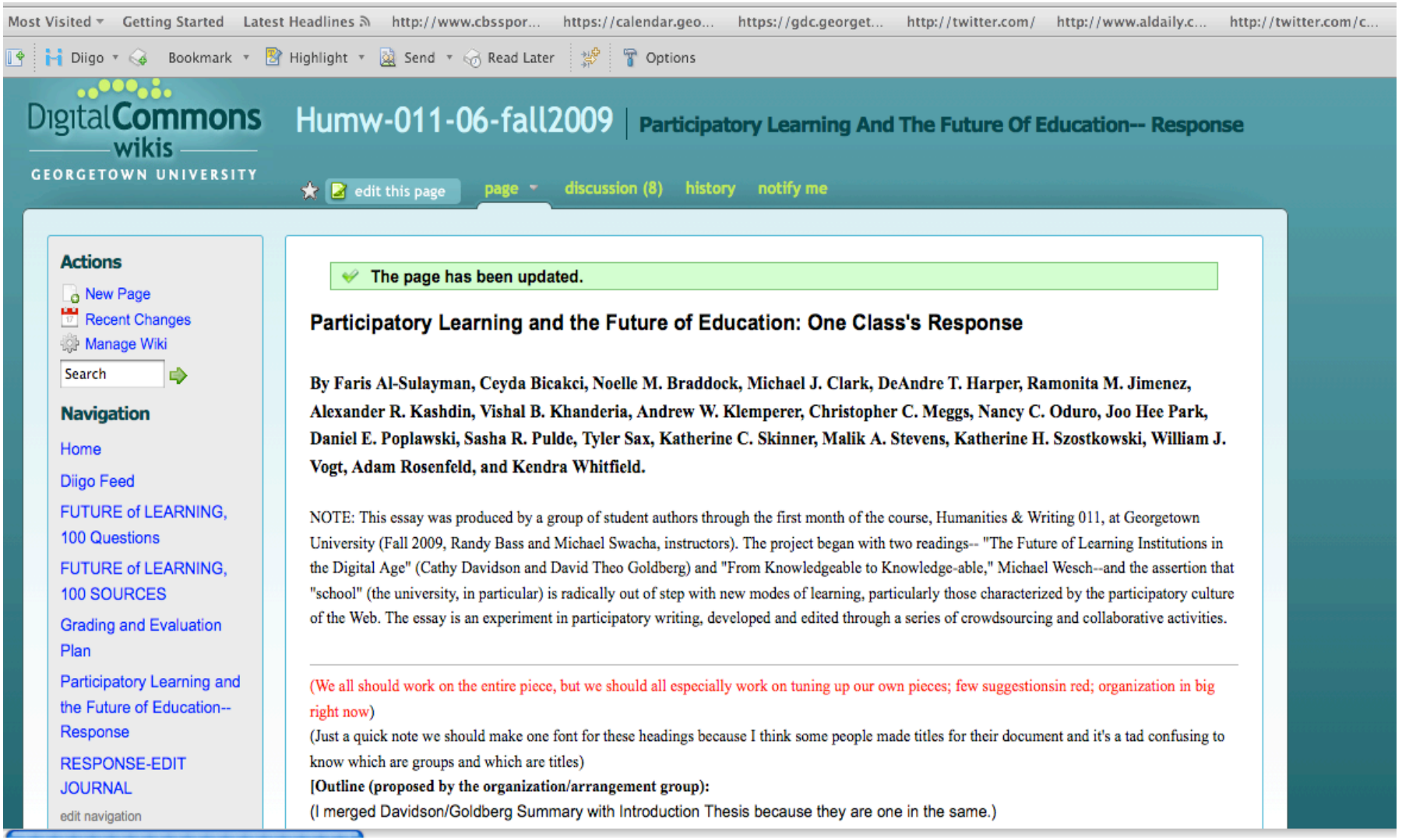
Social Bookmarking



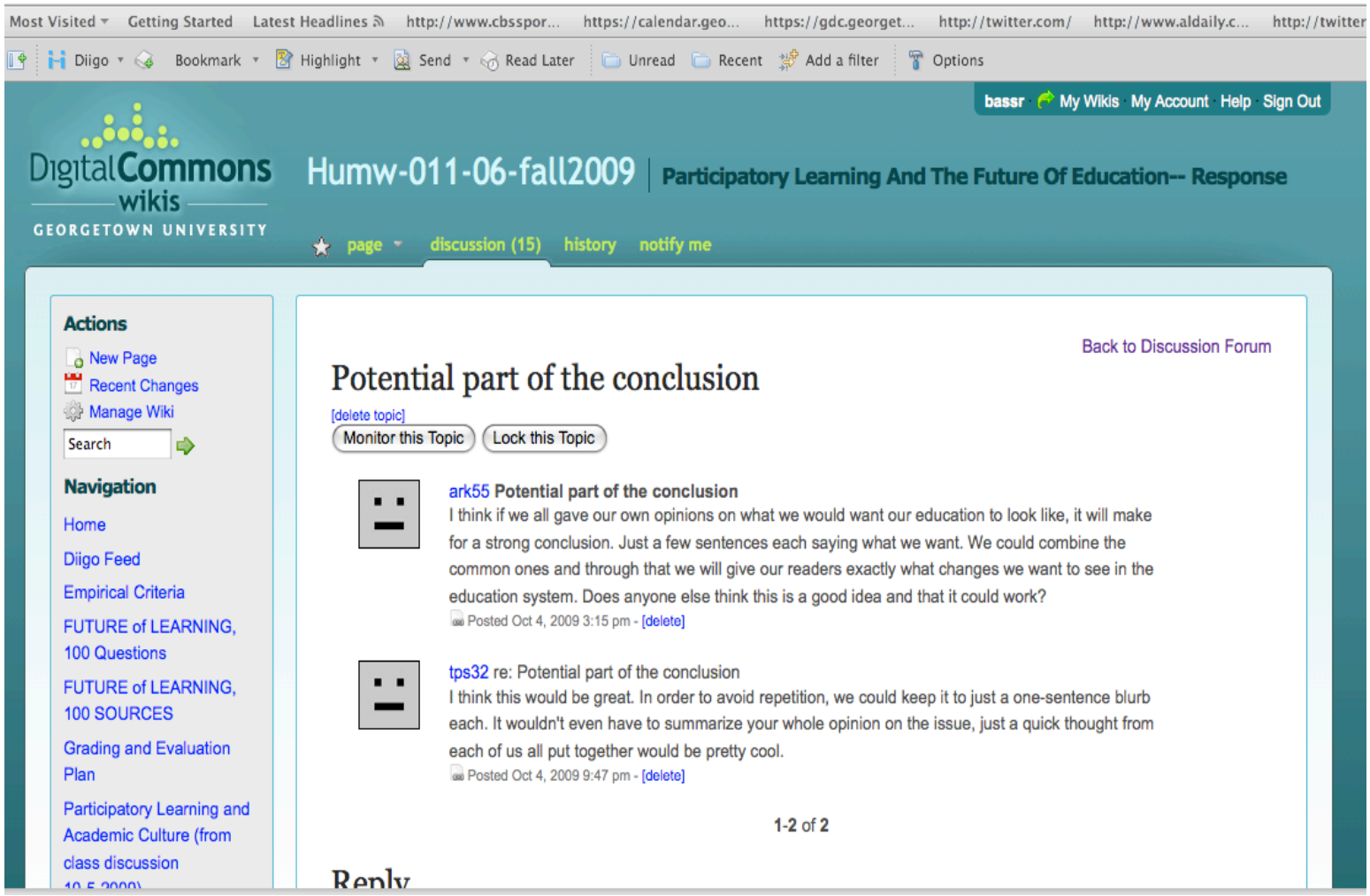
Social Bookmarking



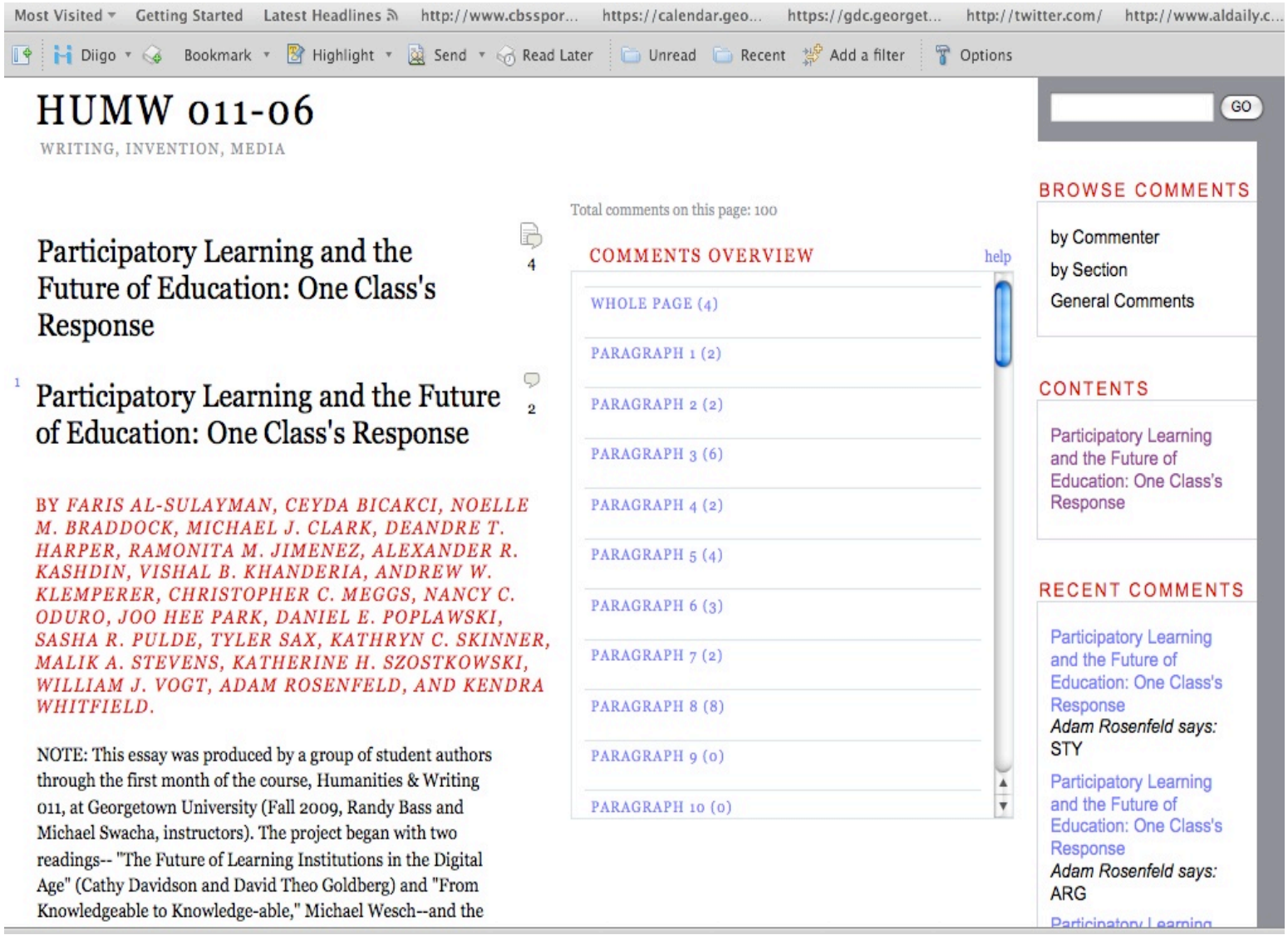
Collaborative Editing



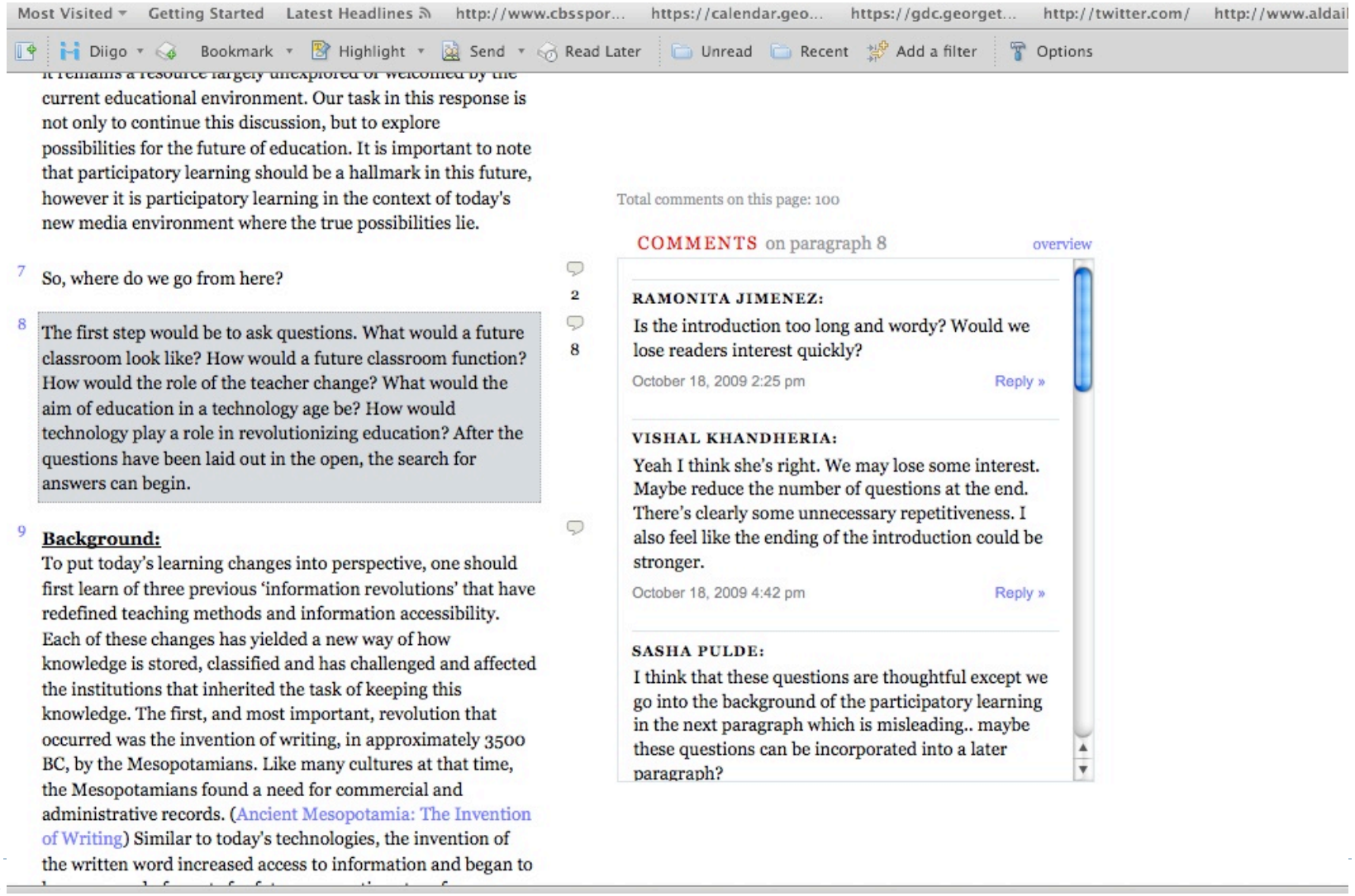
Collaborative Editing (discussion)



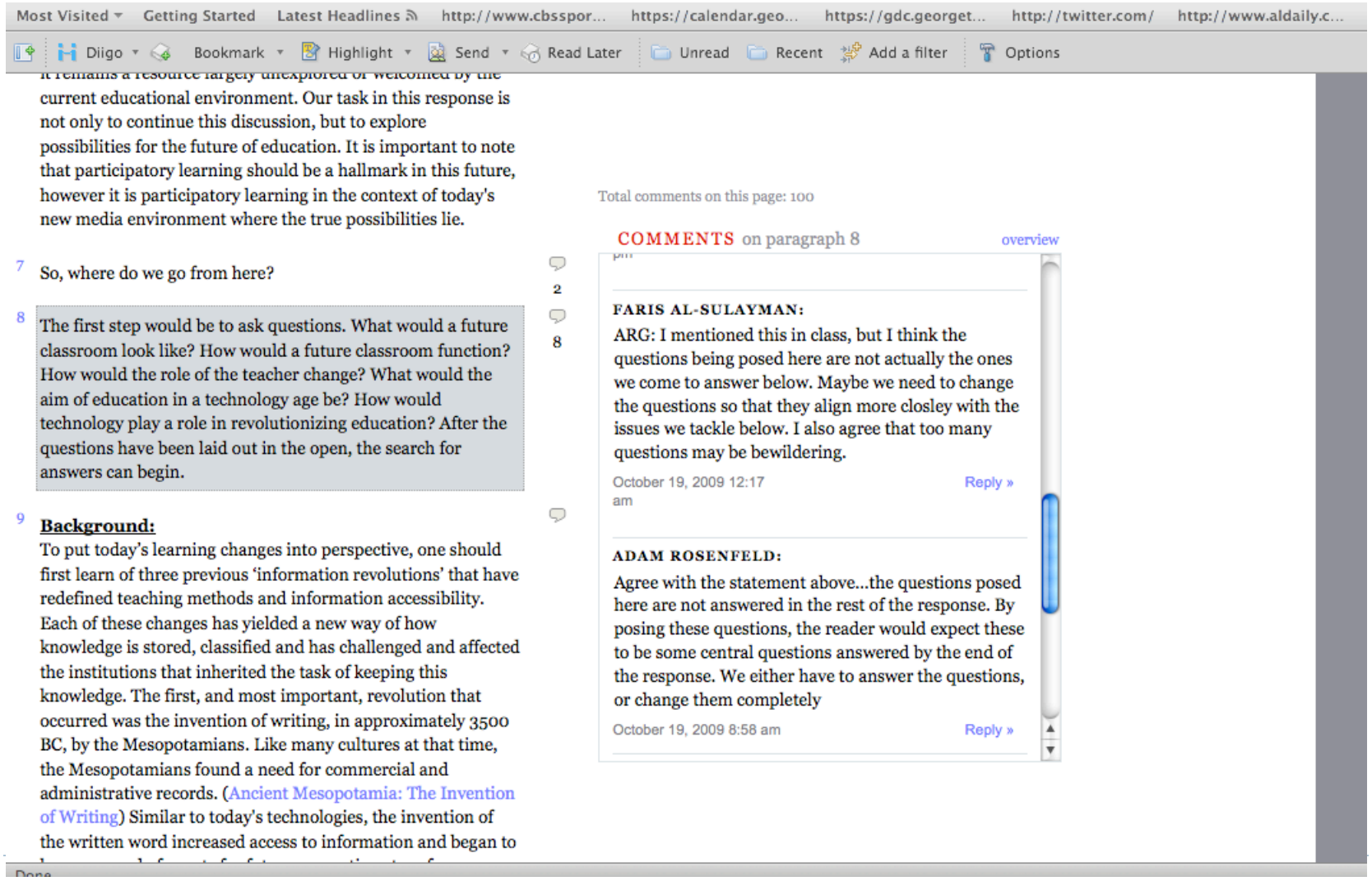
CommentPress



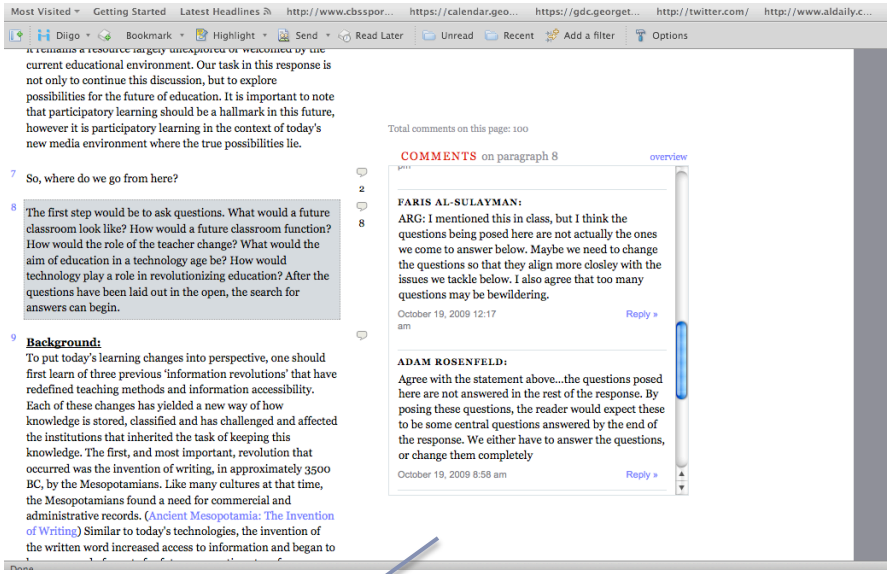
CommentPress



CommentPress



CommentPress editing

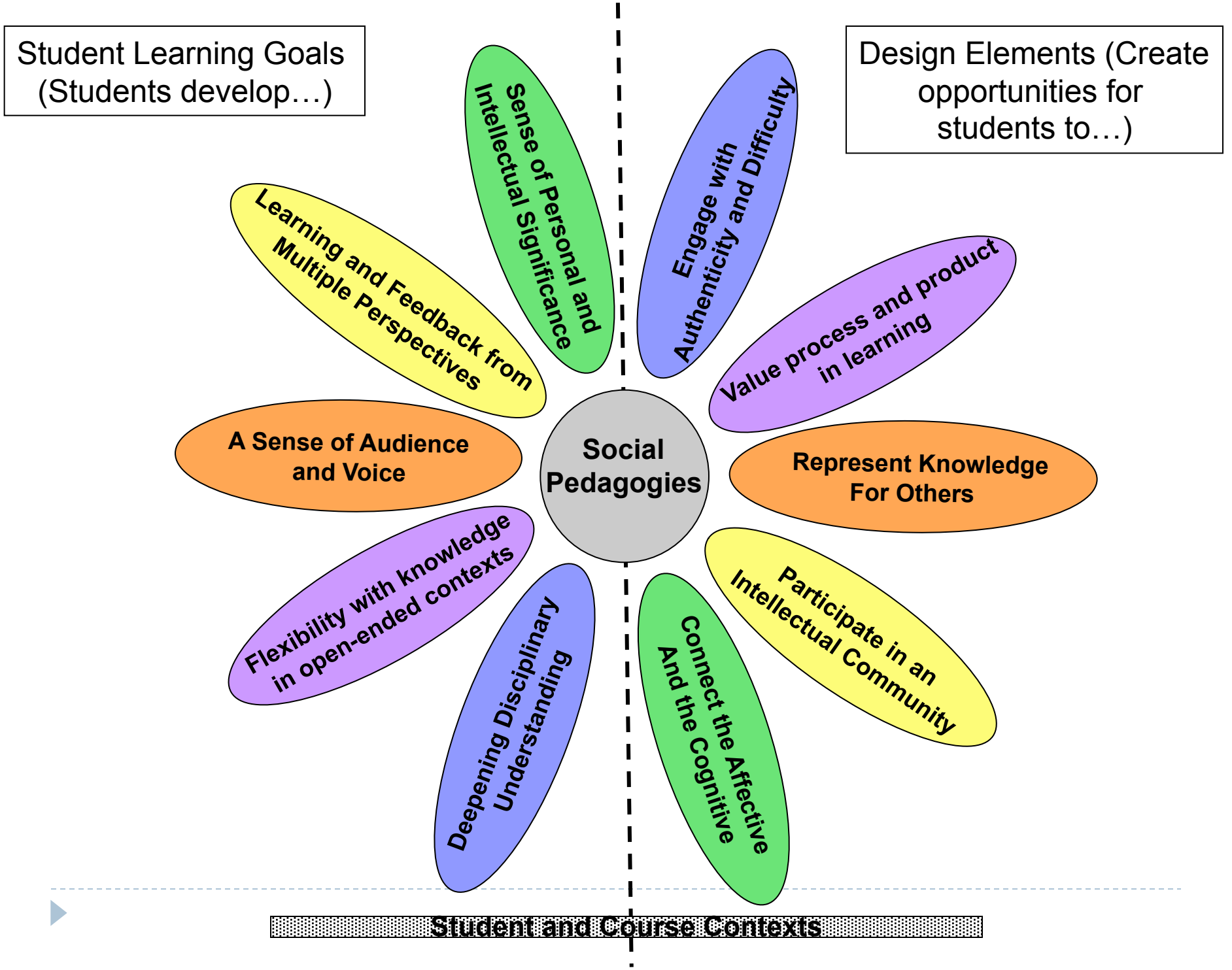


Designing for Difficulty: it is just not good enough yet to publish

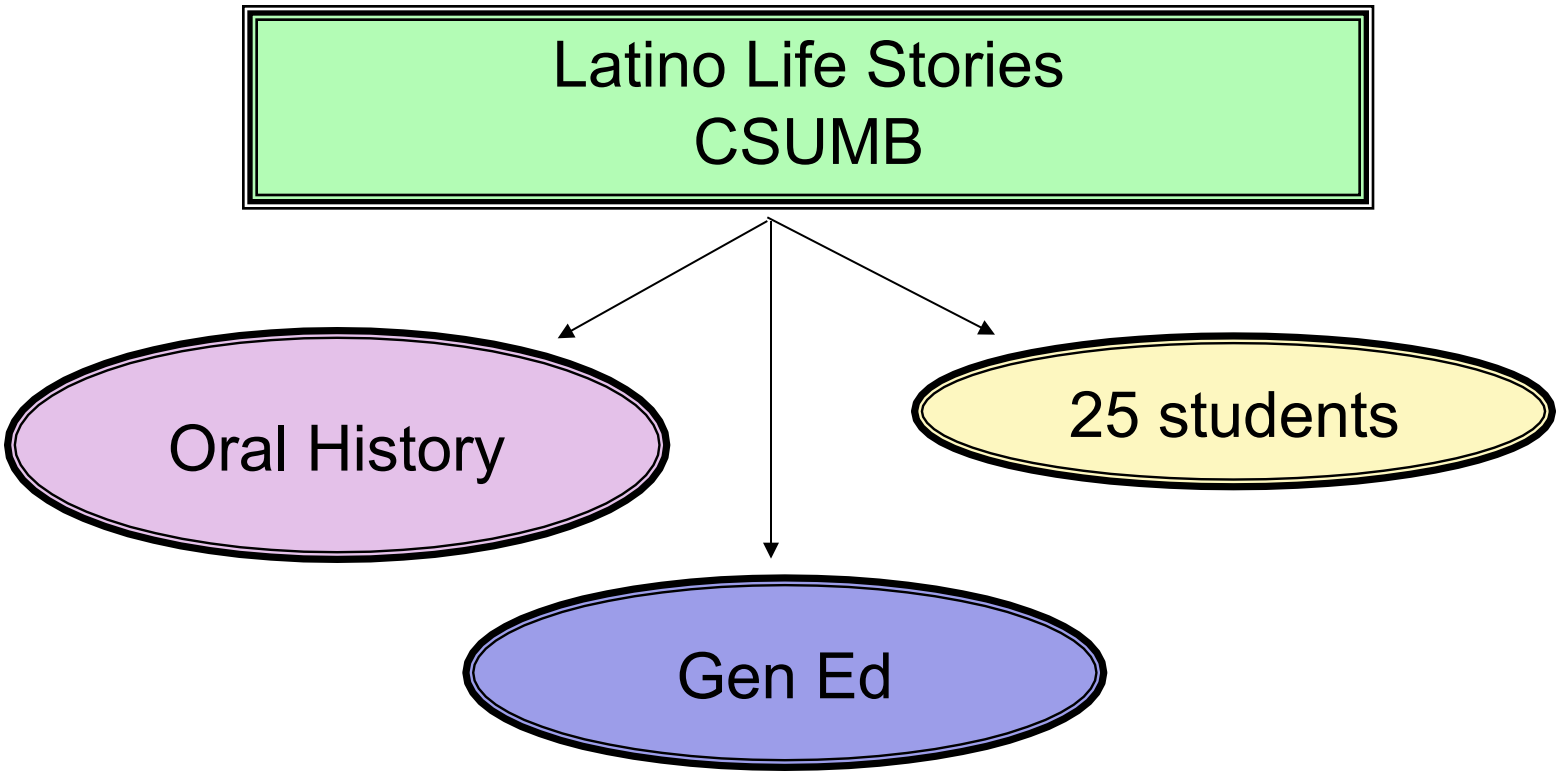
Engage them continuously as their consultant

(1) Reflection: objective critique of wiki, narrative of their contributions, analysis of how this process raises threshold concepts of writing

Led to (2) “Rereading” exercise—they decided they had not sufficiently integrated readings into argument


Student Learning Goals (Students develop…)
Design Elements (Create opportunities for students to…)
Sense of Personal and Intellectual Significance
Engage with Authenticity and Difficulty
Learning and Feedback from Multiple Perspectives
Value process and product in learning
A Sense of Audience and Voice
Social Pedagogies
Represent Knowledge For Others
Flexibility with knowledge in open-ended contexts
Participate in an Intellectual Community
Deepening Disciplinary Understanding
Connect the Affective And the Cognitive
Student and Course Contexts

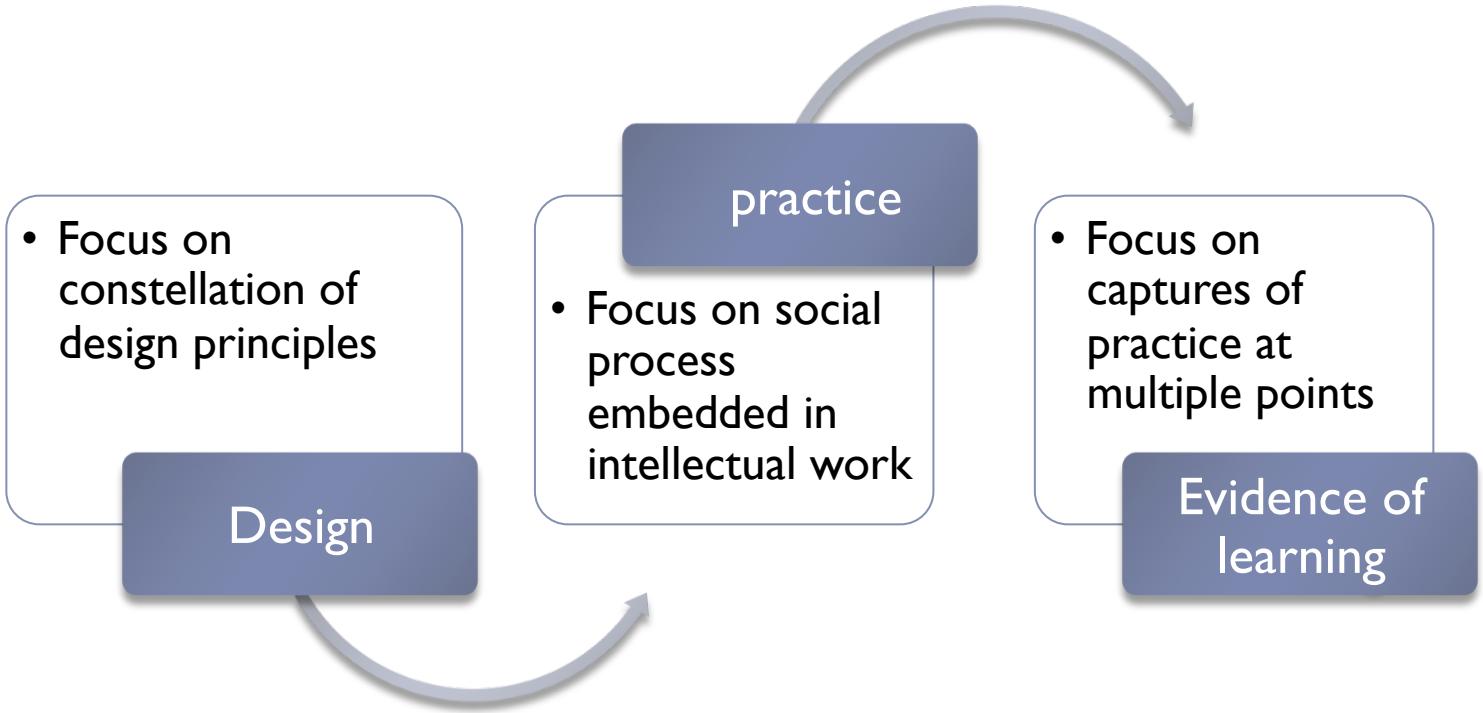
Social Pedagogies and



PRODUCT	PROCESS
what students produce	*what students do*
short biography	draft, write
story script	rethink, condense, refine
digital story	rethink, condense, translate
theorizing paper	explain, reflect, (rethink?)
interview for our project	explain, reflect (rethink)

Michael Coventry, Georgetown

Key elements: Social Pedagogies



Creating the conditions for openness, judgment, and reflection (metacognition)

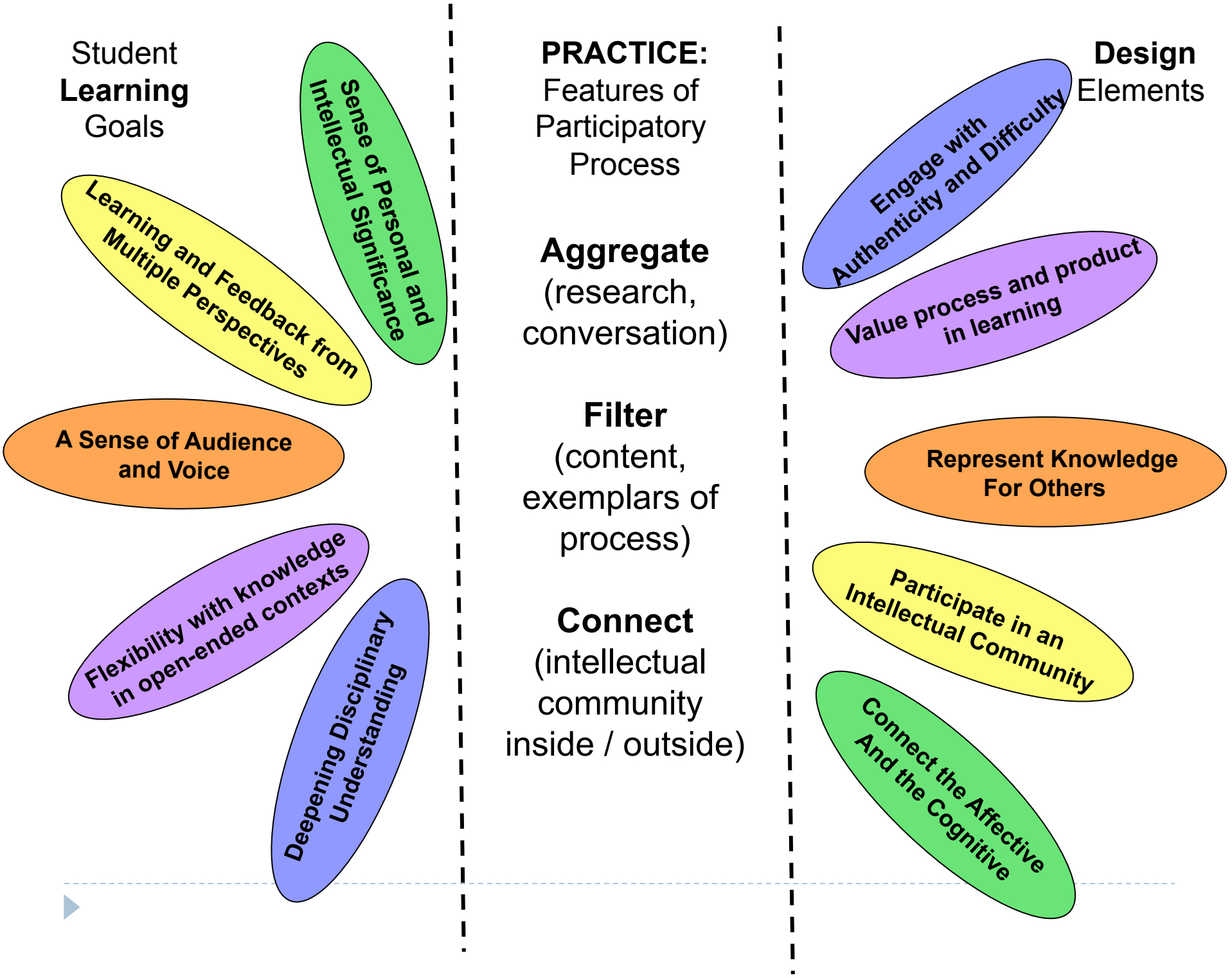
Social Pedagogies: Creating Designs Around Practice to Increase Impact of Authentic Pedagogies

Yesterday…

Tim Kastelle

"Successful Open Business Models"

- Aggregate
- Filter
- Connect


Student
Learning
Goals
Sense of Personal and Intellectual Significance
Learning and Feedback from Multiple Perspectives
A Sense of Audience and Voice
Flexibility with knowledge in open-ended contexts
Deepening Disciplinary Understanding
PRACTICE:
Features of
Participatory
Process
Aggregate
(research,
conversation)
Filter
(content,
exemplars of
process)
Connect
(intellectual
community
inside / outside)
Design
Elements
Engage with Authenticity and Difficulty
Value process and product in learning
Represent Knowledge For Others
Participate in an Intellectual Community
Connect the Affective And the Cognitive

Aggregate, Filter, Connect

Michael Wesch (Anthropology)…Course Site as Portal—creating an intellectual community inside the course and connecting to intellectual communities outside

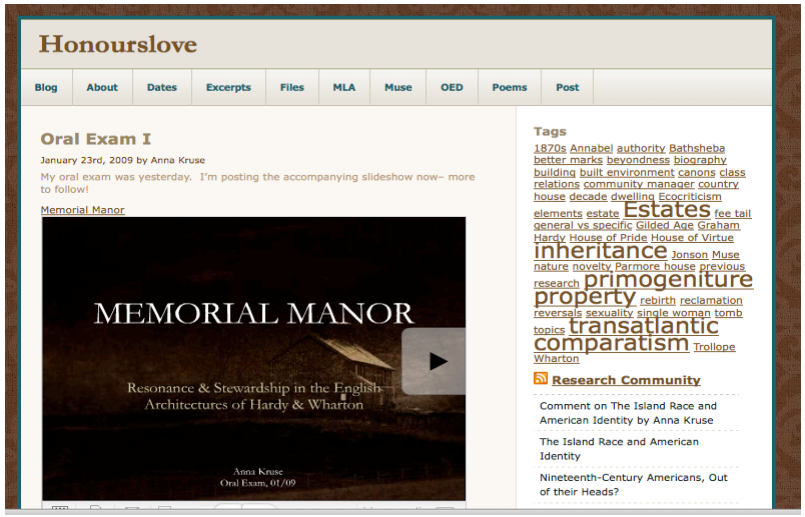
A feed of student webblog posts

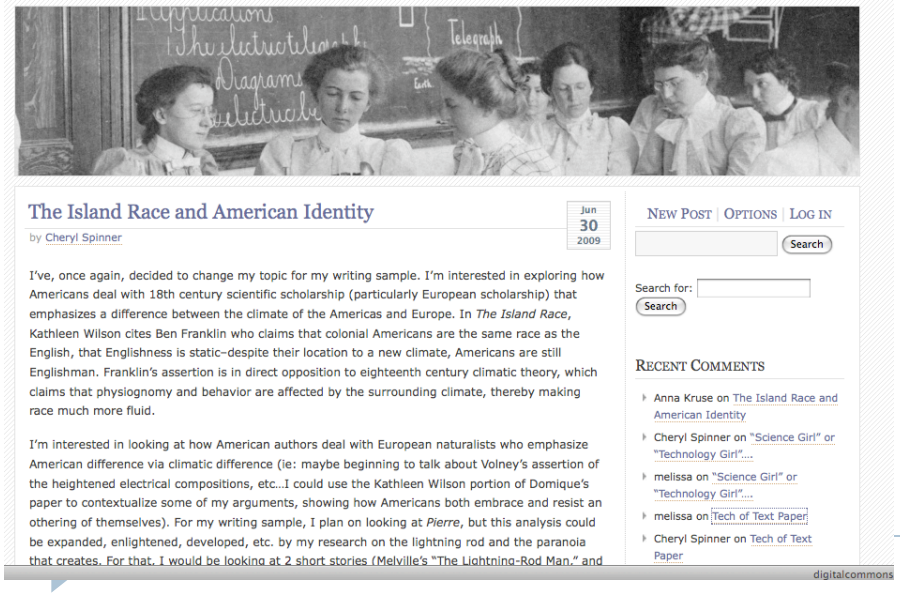
A feed of all Diigo annotations spread across the web, by students and the professor

Updates from the course wiki

Aggregate, Filter, Connect

Networked research group

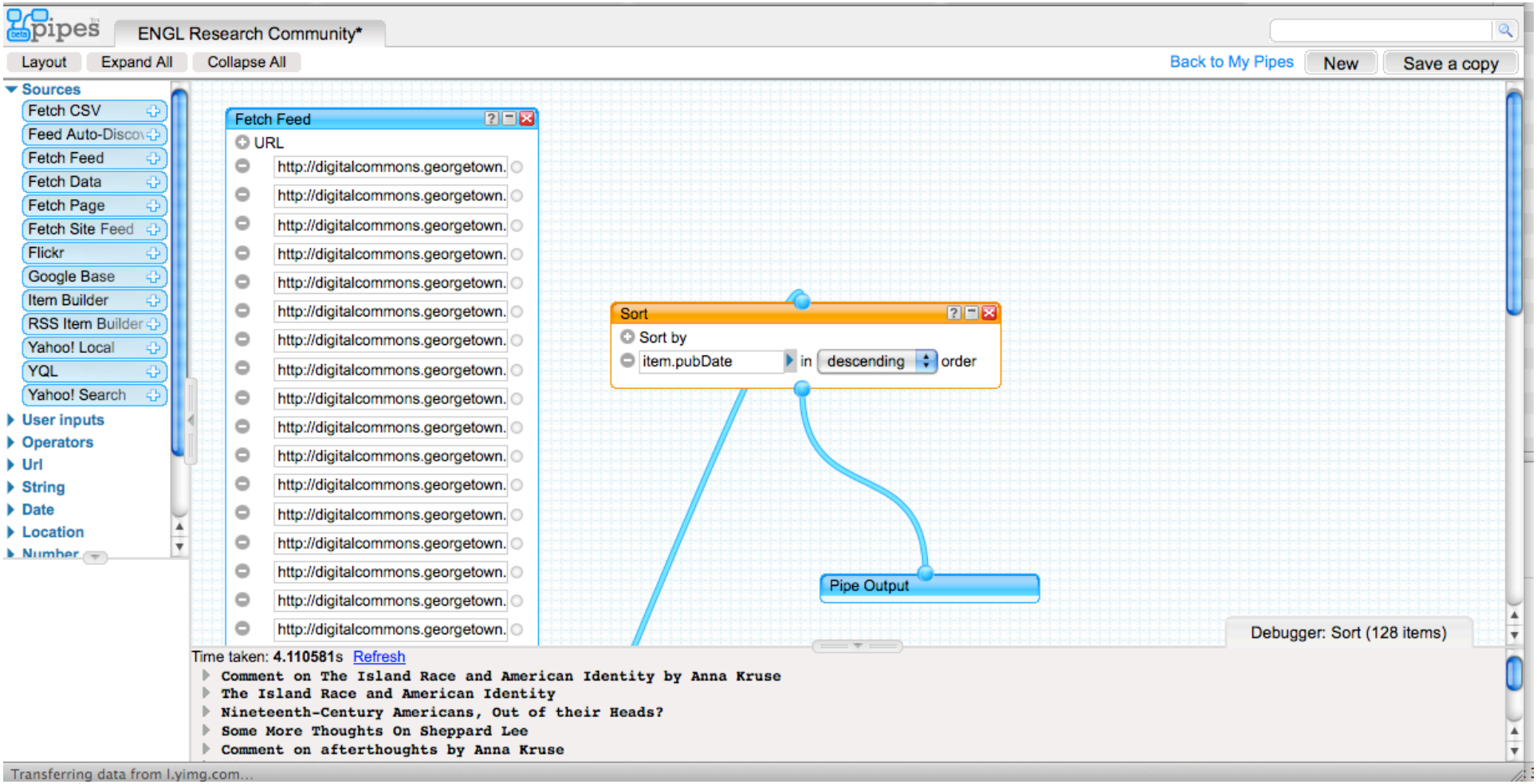




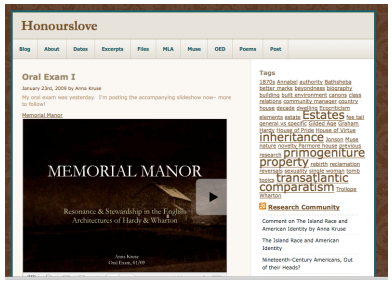
Aggregate, Filter, Connect

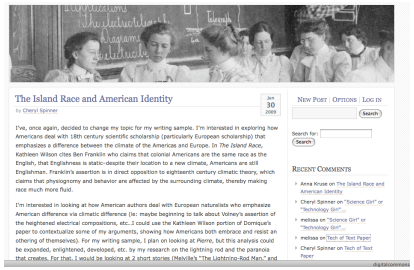
Networked research group

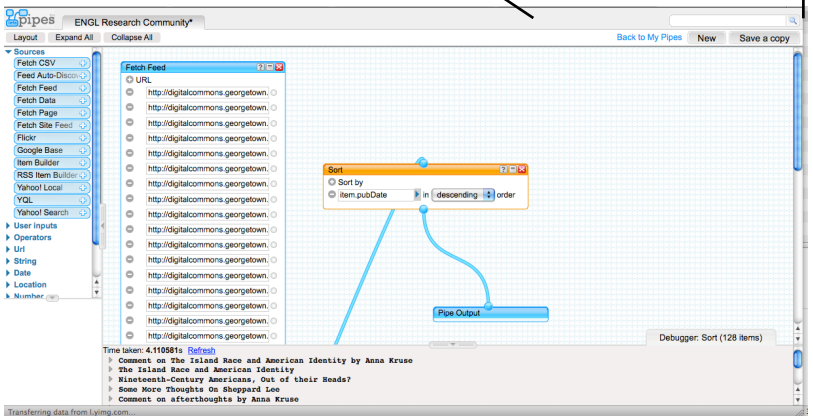
Yahoo Pipes

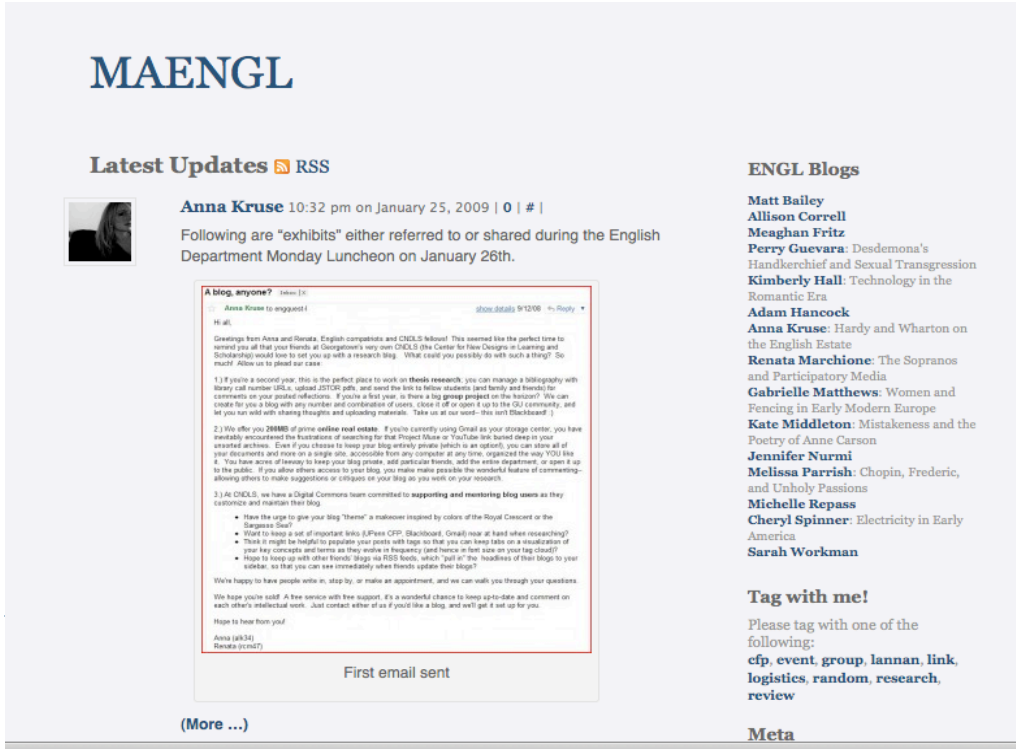


Networked research group

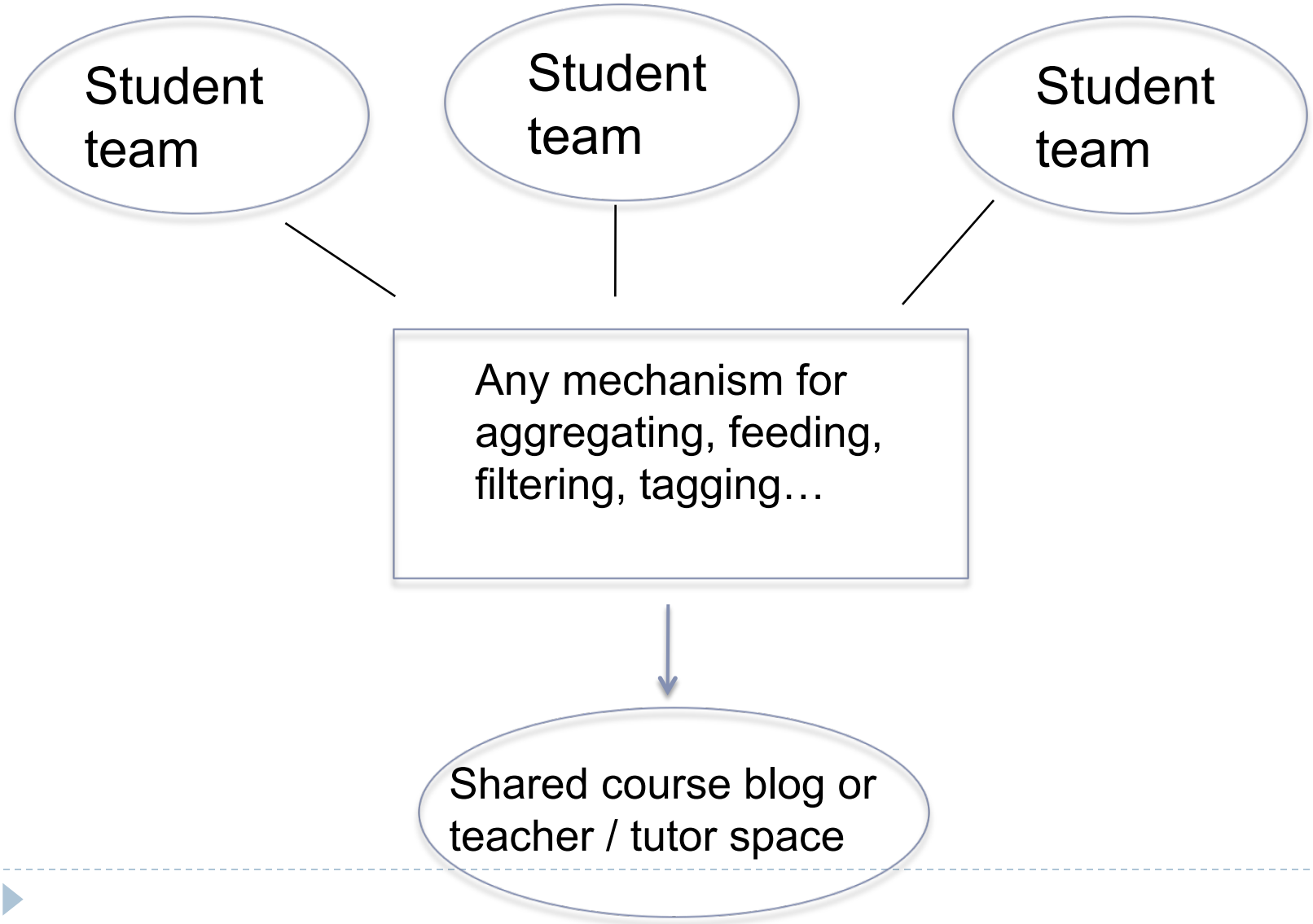








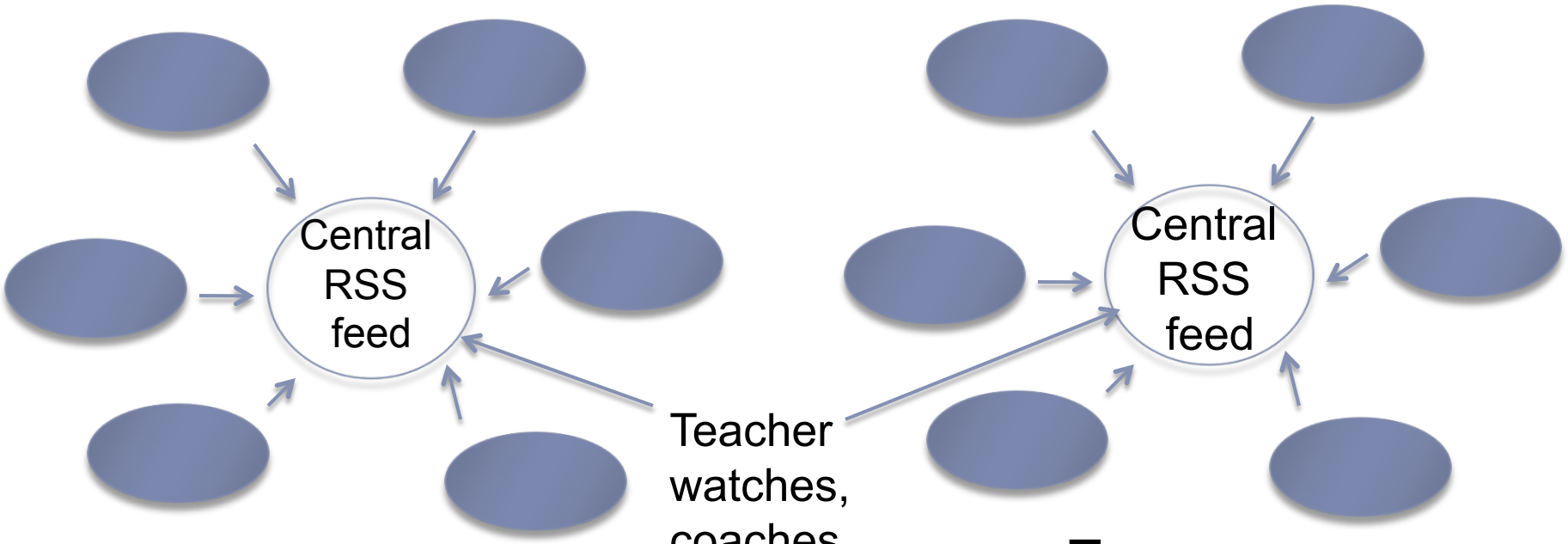
Aggregate Filter Connect



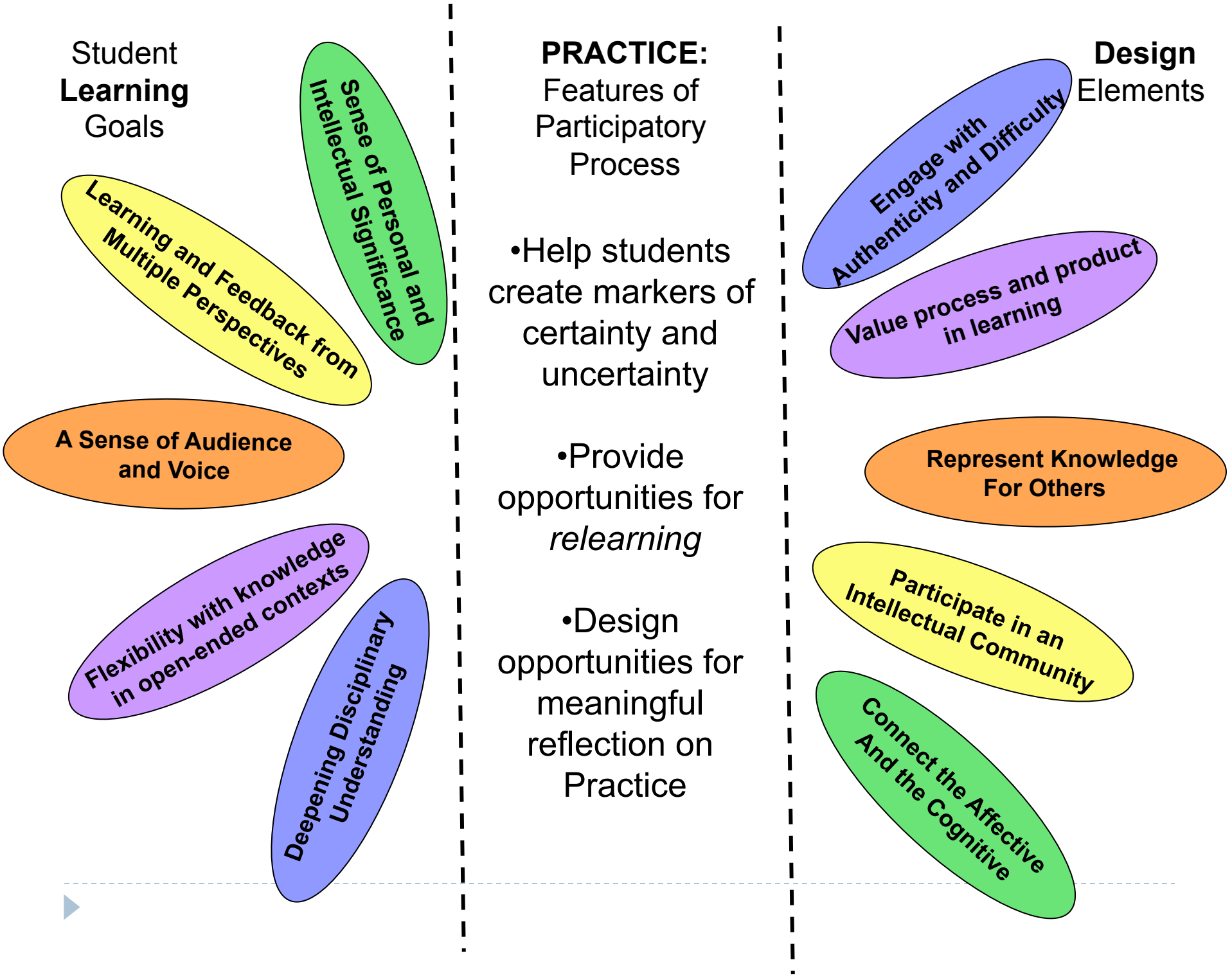
Rajagopalan Balaji, Capstone Course in Engineering (University of Colorado)

(Design competition)

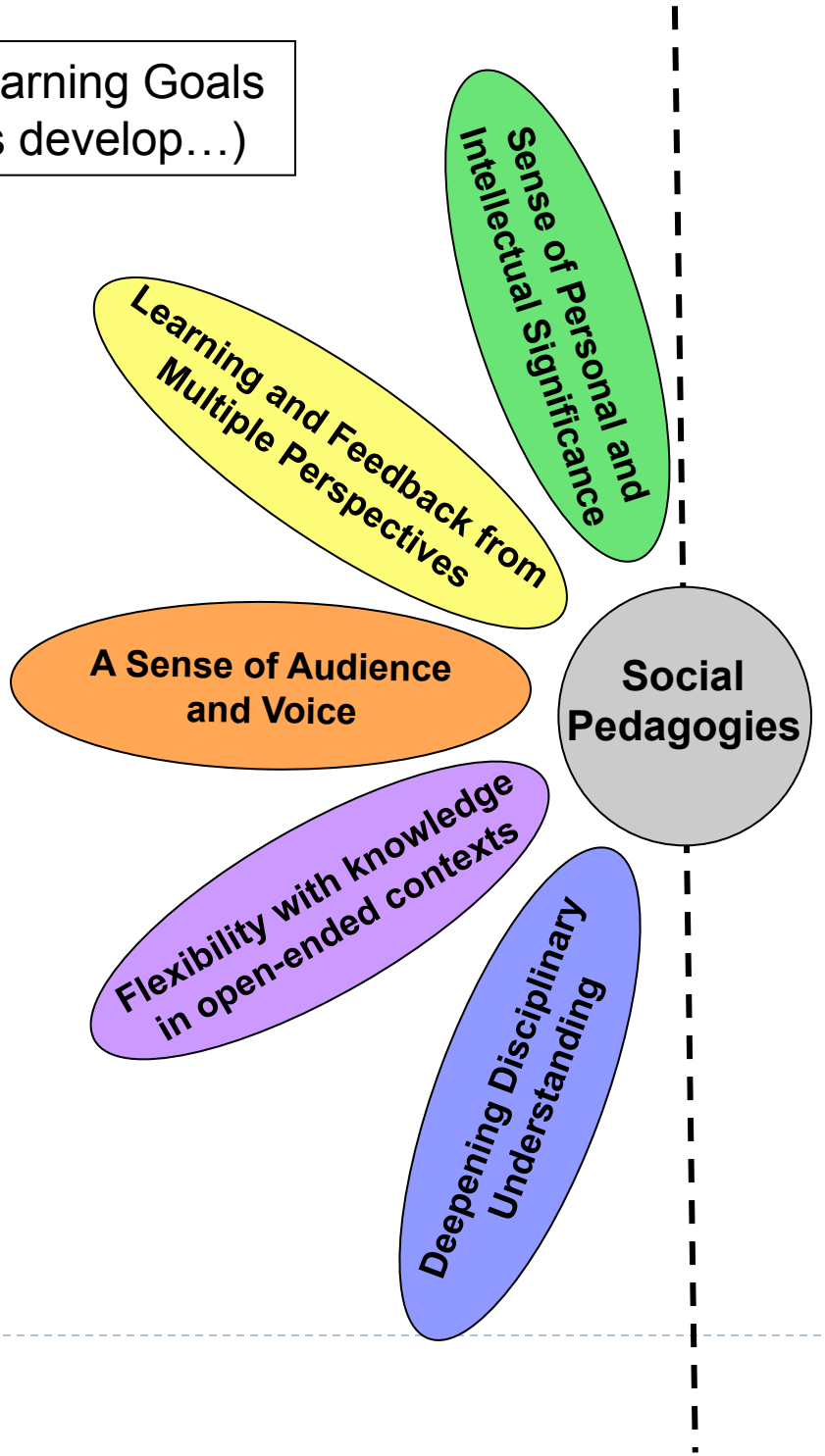
70+ students 12 teams two projects



(key source of capture for intermediate processes)

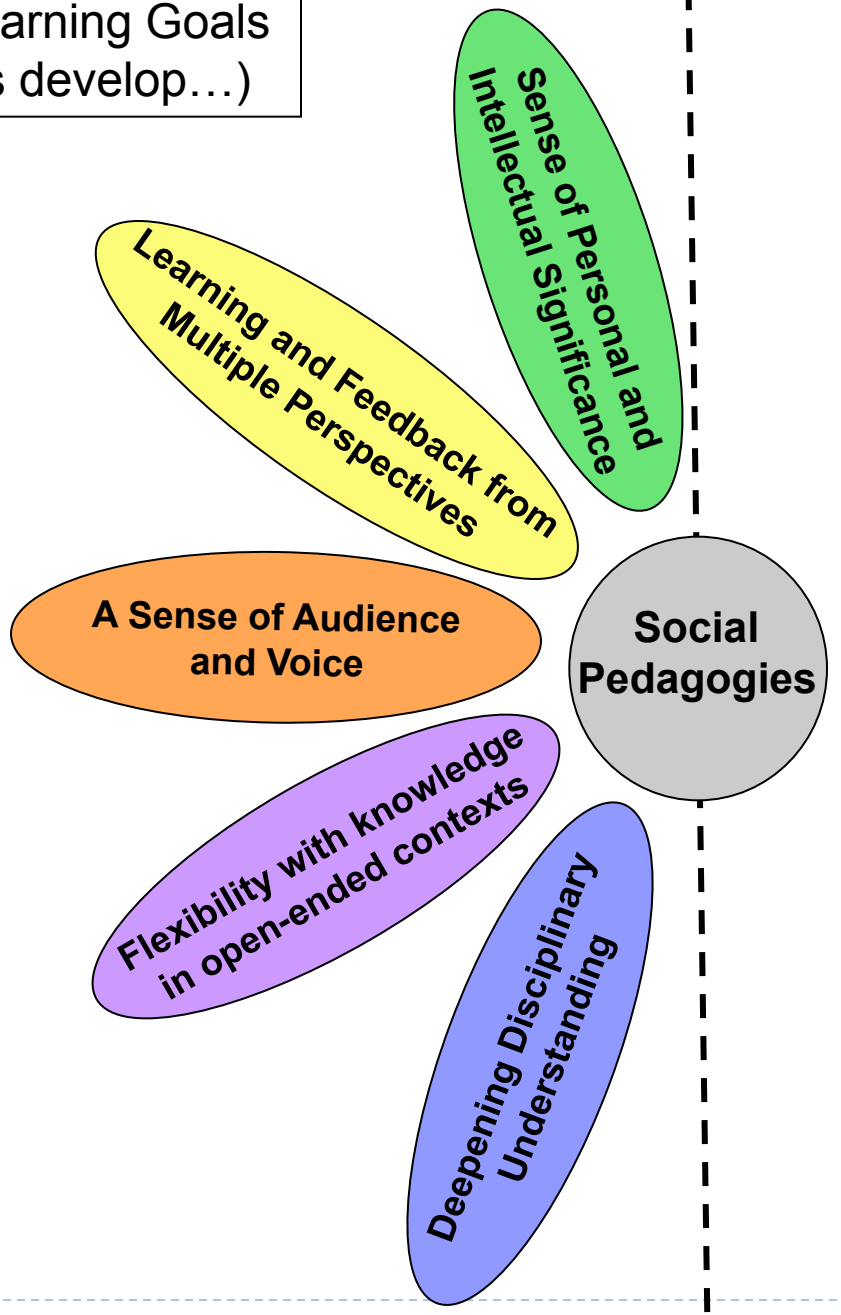

Student
Learning
Goals
Sense of Personal and Intellectual Significance
Learning and Feedback from Multiple Perspectives
A Sense of Audience and Voice
Flexibility with knowledge in open-ended contexts
Deepening Disciplinary Understanding
PRACTICE:
Features of Participatory Process
•Help students create markers of certainty and uncertainty
•Provide opportunities for *relearning*
•Design opportunities for meaningful reflection on Practice
Design
Elements
Engage with Authenticity and Difficulty
Value process and product in learning
Represent Knowledge For Others
Participate in an Intellectual Community
Connect the Affective And the Cognitive

Student Learning Goals
(Students develop…)



What does *evidence* look like for these kinds of student learning goals?
Where do you look?
How do you get it?

Student Learning Goals
(Students develop…)



What does evidence look like?

Social pedagogies open up a set of filters or conditions for student learning–such as prior knowledge, identity, uncertainty and troublesome knowledge–that can be ignored or suppressed through more bounded, traditional pedagogies.

Interest in adaptive expertise requires us to pay attention to the artifacts of process as an intrinsic part of building knowledge through practice

Collaborators

- Thanks to the Teagle Foundation for their Support of the Project
- The Social Pedagogies Project is directed by Randy Bass and Heidi Elmendorf (Georgetown University).

- bassr@georgetown.edu and hge@georgetown.edu

- Members of the Social Pedagogies Working group, including Michael Marx, Catherine Berheide, Bret Eynon, Cecilia O'Leary, Joe Ugoretz, Rachel Theillheimer, Michael Coventry, Peter Felten, Tricia Ferret, Joanne Stewart and Dan Bernstein.
- Michael Coventry (Georgetown) and Matthias Oppermann (Humboldt) for their meta-project, the Digital Stories Multimedia Archive.