Exploring the use of Social Media to support Teaching and Learning of Science

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Who am I?

Rachel Moll

@rfmoll

Vancouver Island University faculty member interested in applications of social media in science education. Complexity theorist. BC sun and snow enthusiast.

Nanaimo, BC

Follow

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Tweets

Rachel Moll @rfmoll 1m

Finally set up a blog! It's called Social Media Science! Check out my first post about what I hope to do with it. wordpress.viu.ca/mollr/testing-...

Expand

destinct @crysone 23 May

Ski, surf, sushi and a ceremony. Starts in 1 day.

Retweeted by Rachel Moll

Expand

Rachel Moll @rfmoll 15 May

Set up my first blog with help from @jhengstler + wrote my first post...but can't share yet. Stay tuned for news from 'Social Media Science'

Expand

Rachel Moll @rfmoll 6 May

The length of the #LB32 conference day is exactly the amount of time my iPad battery will last! Coincidence. I think not.

Expand

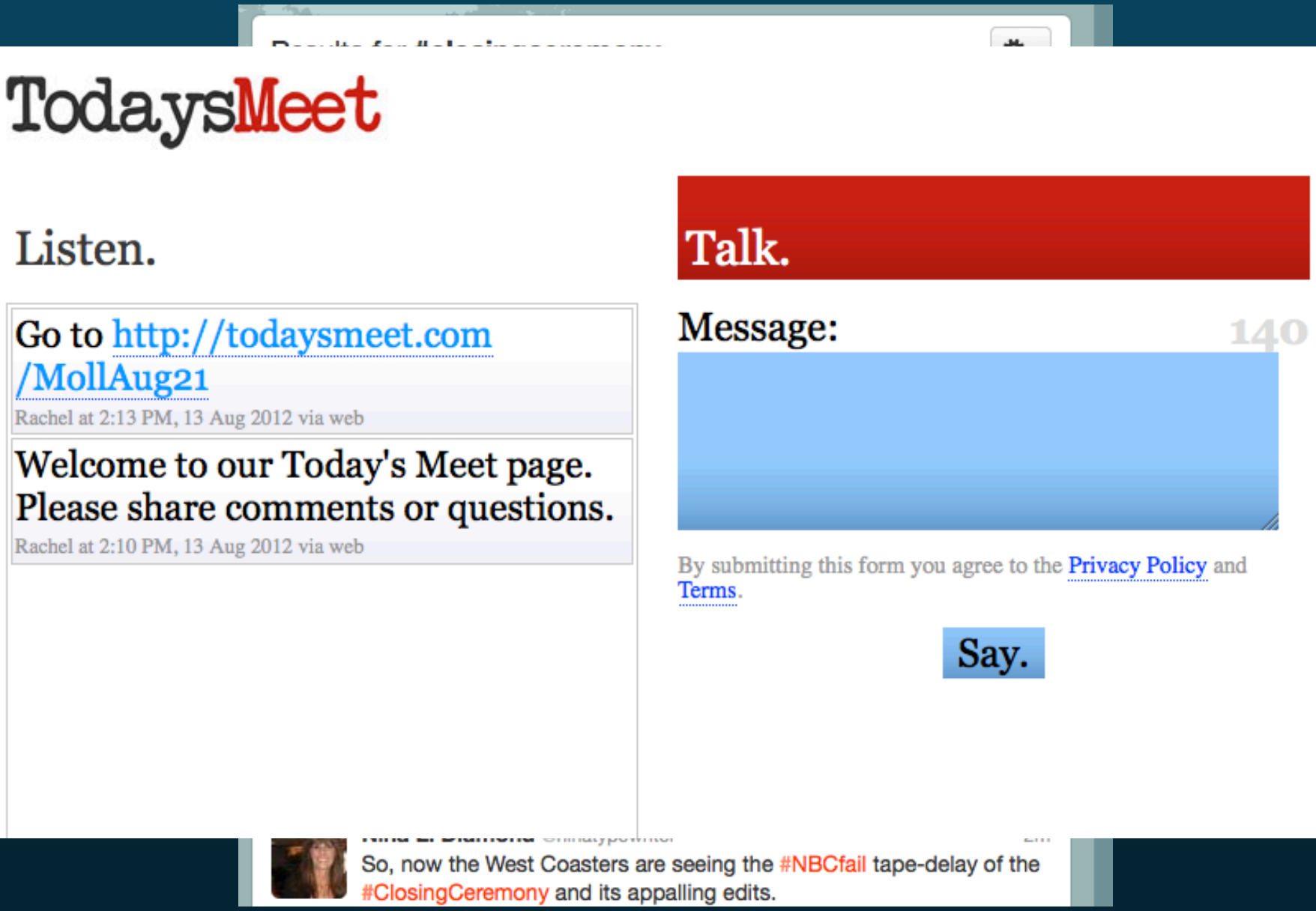
Faculty of Education

VANCOUVER ISLAND UNIVERSITY

The Road Map

- Background
- Theoretical Framing: Complexity Thinking
- Results
- Conclusions

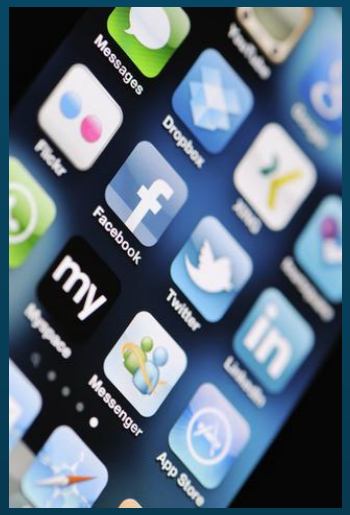
Comments and Conversation?



Social Media
Our Working Definition:

so•cial me•di•a (*sō 'shəl mē'dē-ə*) ➡ ***n.***

software and web-based technologies that facilitate interactive dialogues and connectivity using the capabilities of Web 2.0 technology that allow for the creation and exchange of user generated content (Kaplan & Haenlein, 2010)



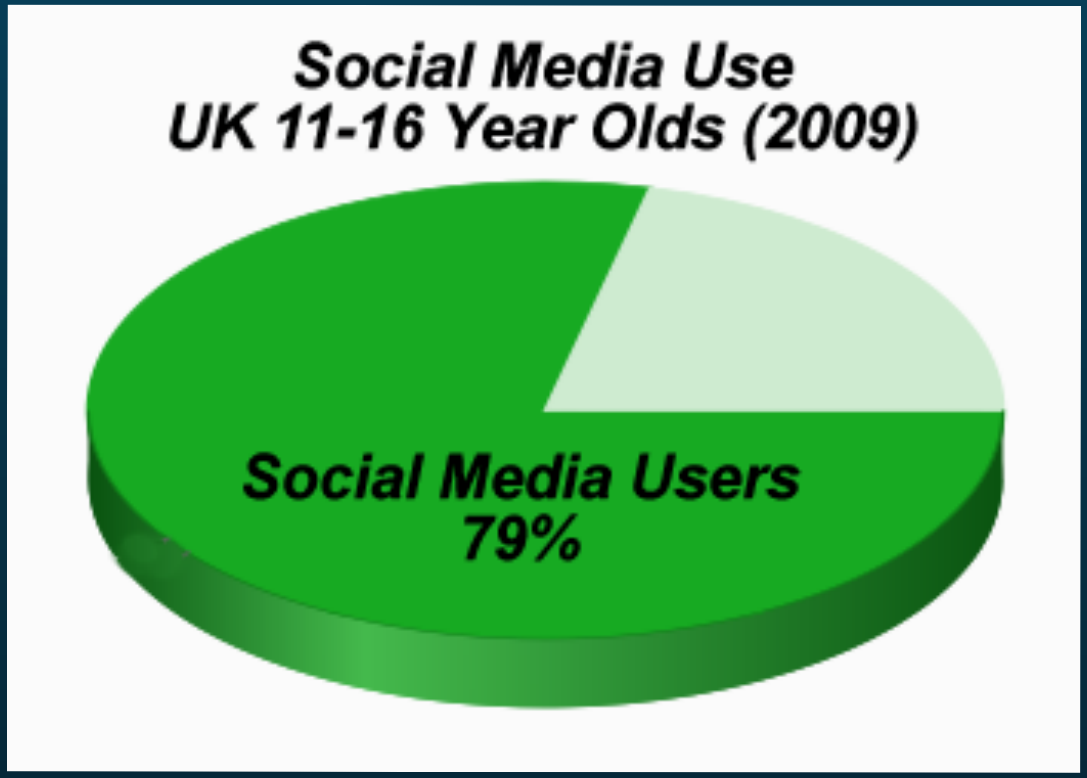
Social Media Use is Rising

Daily Use of Social Media Sites

33%	US College Students 2006*
50%	US College Students 2007*
70%	US College Students 2009**
19%	Canadians 2010
35%	Canadians 2011

*Educause,ECAR Study of Undergraduate Students & Information Technology (2008)
**Smith, Salaway, Borreson, & Katz (2009)
***Ipsos Reid (2011)

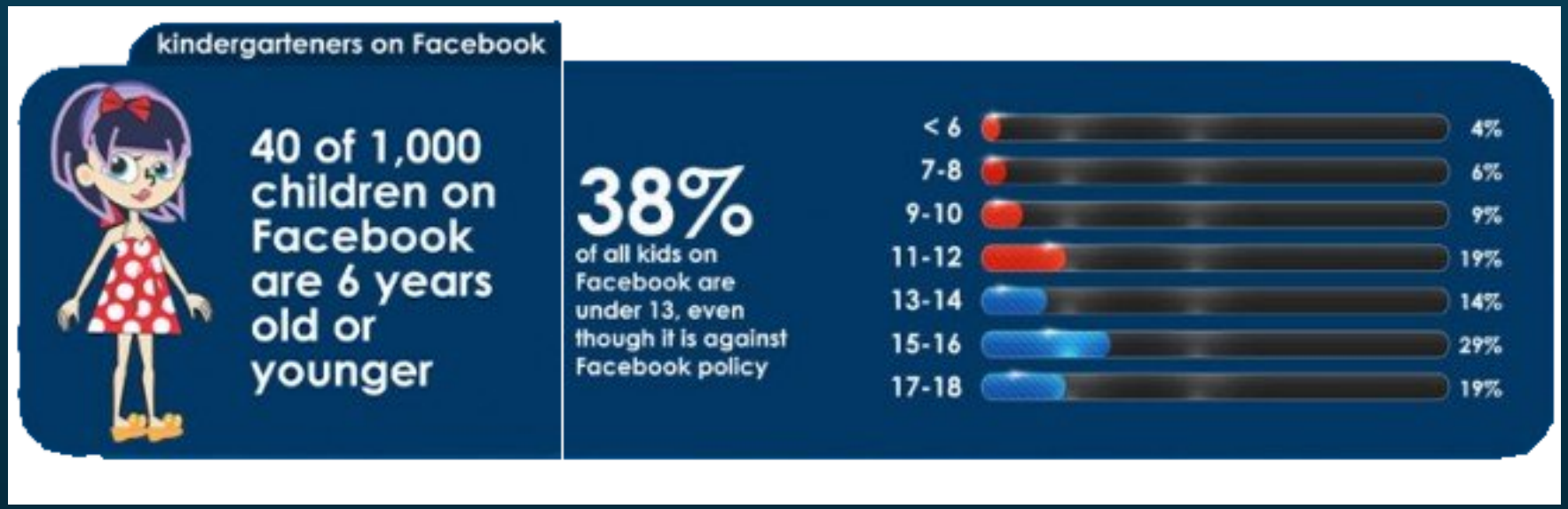
Student Use: 11-16 Yrs



Clark, Logan, Luckin, Mee, & Oliver (2009)

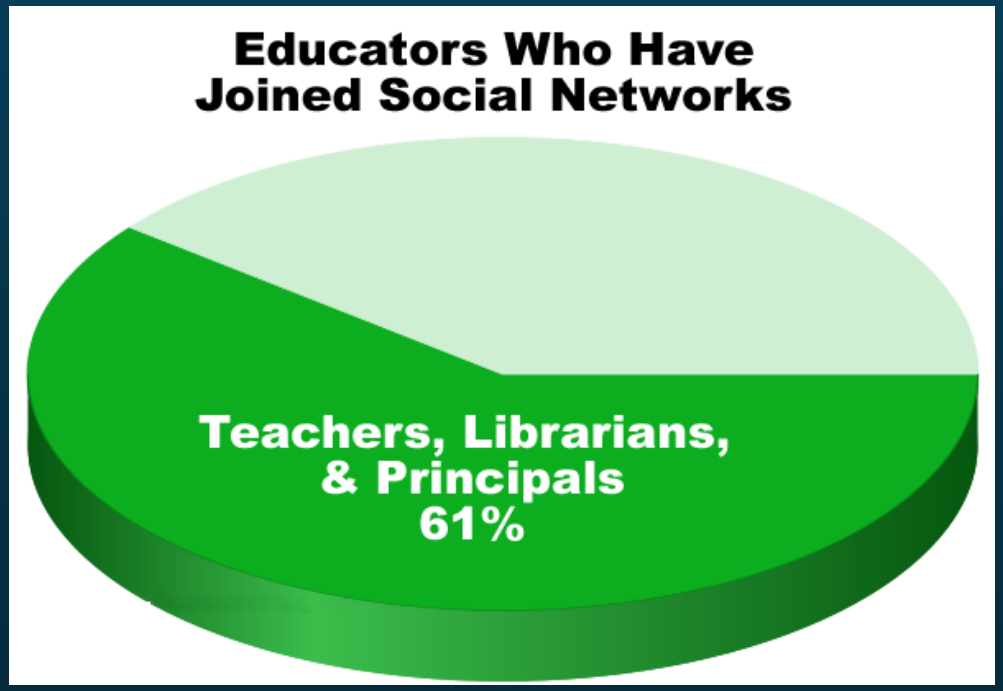
38% Kids on Facebook <12

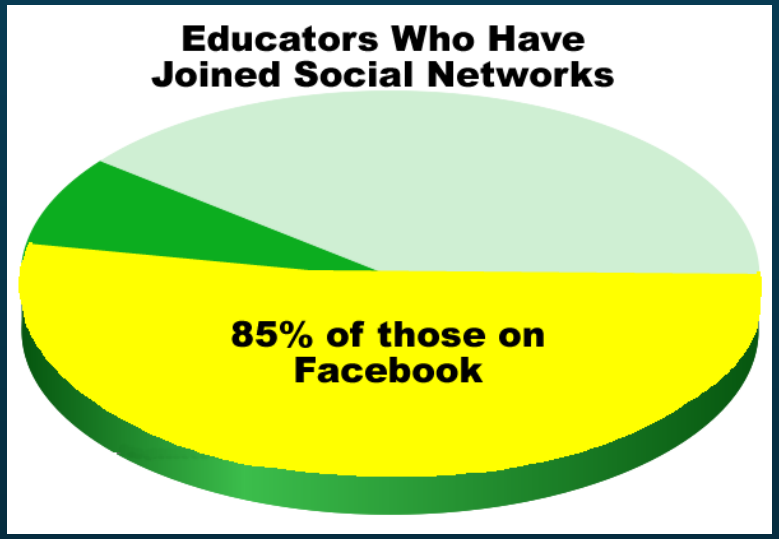
Survey of 1000 Parents of Children on Facebook (4/2012)



MinorMonitor (2012)

Educator Use: US 2009





Joiners are more active online.

edWeb.net et al.

Example Studies: Facebook

- Facebook use correlates with measures of social capital – particularly bridging capital (the ability to maintain weak ties with lots of people) (Ellison et al., 2007)
- Facebook use as a means of identity development has been studied (e.g., Pompek et al., 2009)
- Students use FB more than faculty (Roblyer et al., 2010)

Example Studies: Twitter

- Use of Twitter in a first year university course increased measures of student engagement and grades (Junco et al., 2011)
- Used Twitter to enhance social presence within online courses (Dunlap & Lowenthal, 2009)
- Students who viewed their instructors' social tweets rated them as high in perceived credibility (Johnson, 2011)

Example Studies: Mobile Phones

- A New Zealand study examined student cell phone use in a science classroom as a factor that contributes to networked inquiry learning (Khoo et al., 2012)
- A rubric was developed for evaluating the pedagogical affordances of various mobile web 2.0 tools (Cochrane & Bateman, 2009)
- Design principles proposed for the implementation of mobile learning in higher education (Herrington et al., 2009)

Background Summary

- Student participation in social media is high
- …but little support for the 'digital native' (Prensky, 2001) claim (Bennett et al., 2008)
- Student and teacher use of social media resources for learning is not sophisticated (Clark et al., 2009)
- Limited evidence of a digital divide (Waycott et al., 2010)

Background Summary

- There is a lack of empirical work in how social media is used in disciplinary contexts
- “contextualized rooted discussions of the potential of Web 2.0 in teaching are rare” (Brown, 2012)

Questions, comments so far?

Theoretical Perspectives on Social Media and Learning

- Some work is atheoretical (reports of practice) or based on pedagogical design principles that were atheoretically developed (e.g., Chickering & Gamson, 1987)
- Canole et al. (2011) provided examples of use of communities of inquiry, actor network theory, activity theory, and communities of practice to study affordances of ‘cloudworks’

Theoretical Perspectives on Social Media and Learning

"it is important to understand that although social networked systems might be emergent and self regulating, some forms of coordination or orchestration is usually required to support the sort of meaning making that corresponds to learning"

(Ravenscroft, 2011)

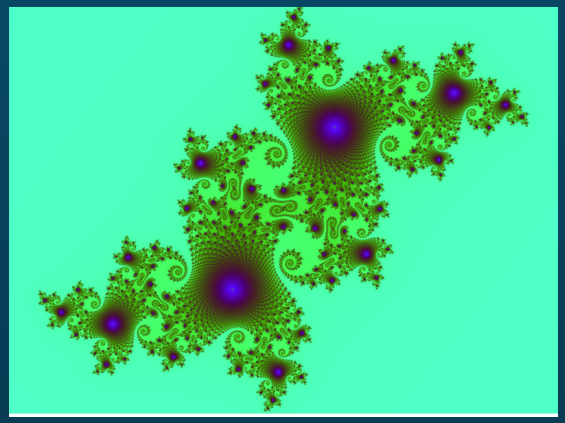
Principles of Connectivism

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality

Theoretical Perspectives on Social Media and Learning

"We cannot simply 'hijack' new digital literacies for learning and instead need a much deeper and more critical discourse about design that fully embraces the need to carefully understand and conceptualize…emerging technology mediated learning ecosystems"

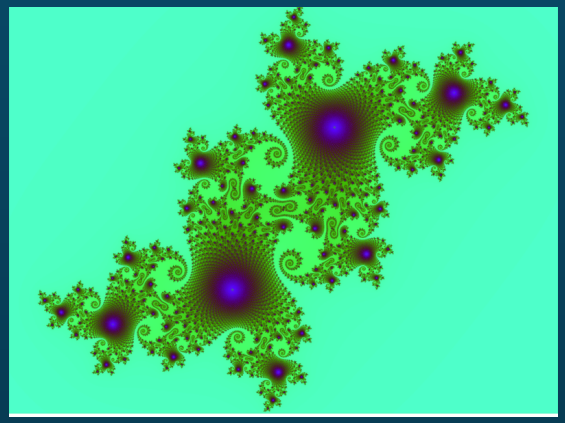
Ravenscroft (2012)



Theoretical Perspective: Complexity Thinking

(Davis & Sumara, 2006)

- Complex systems are learning systems
- Draws on characteristics and qualities of complex systems
- Transdisciplinary perspective in education research

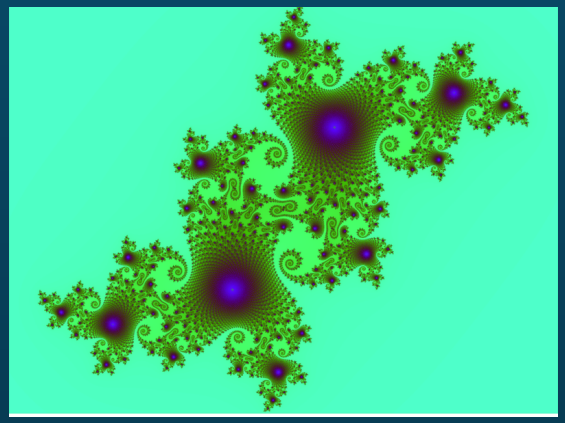


Theoretical Perspective: Complexity Thinking

(Davis & Sumara, 2006)

Complex systems arise in the interactions of many autonomous agents/elements, which collectively manifest properties not exhibited by the agents/elements independently…

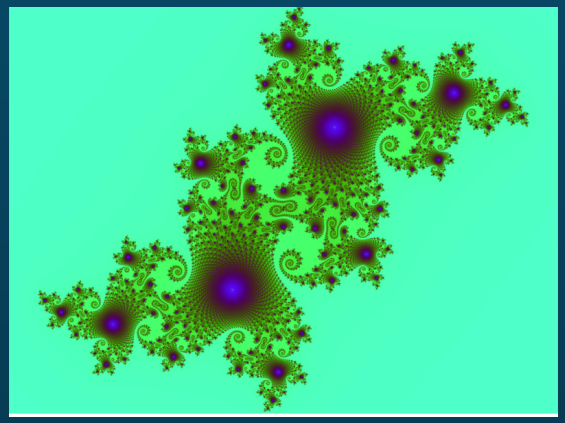
…are learning systems.



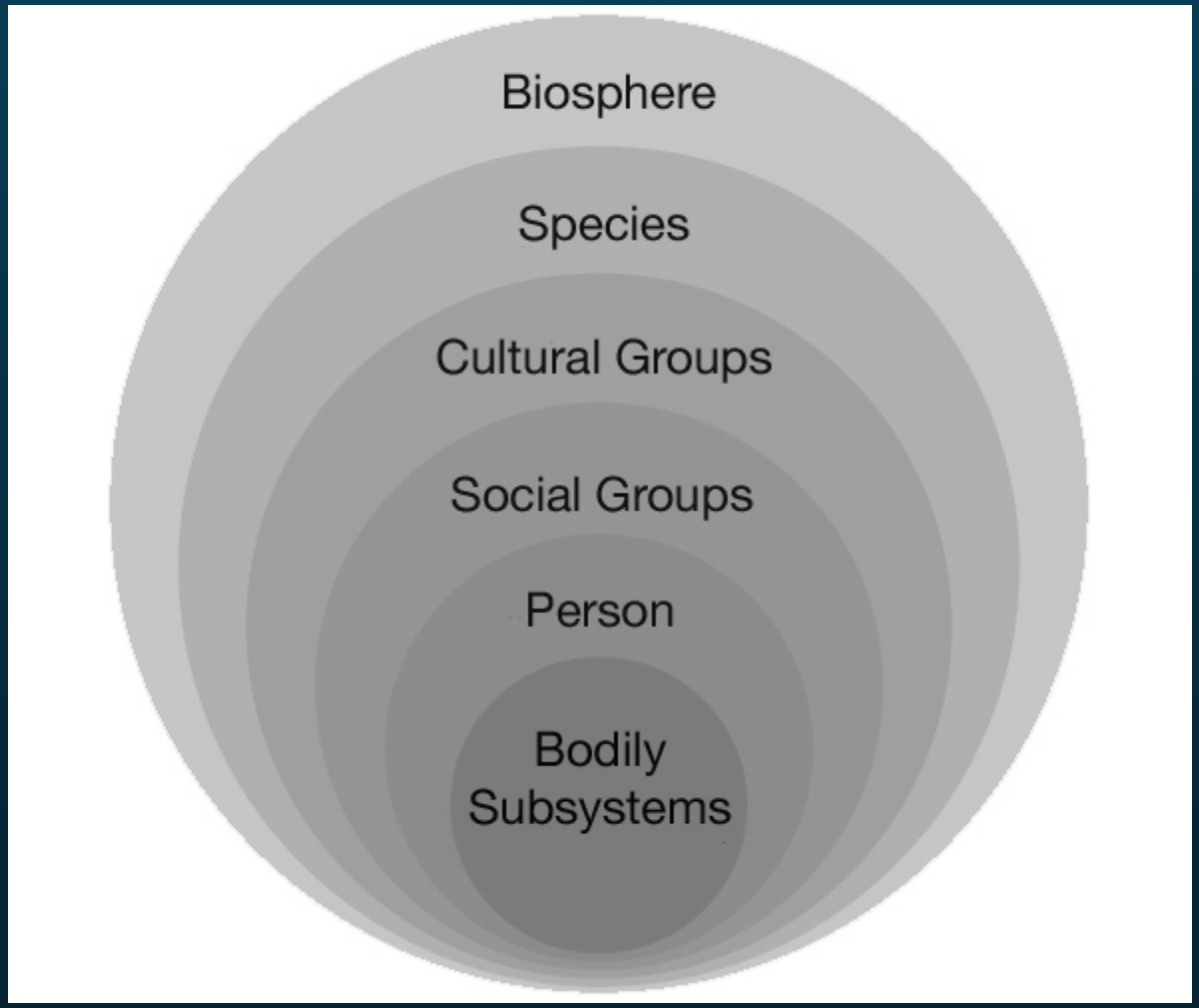
Qualities of Complex Systems

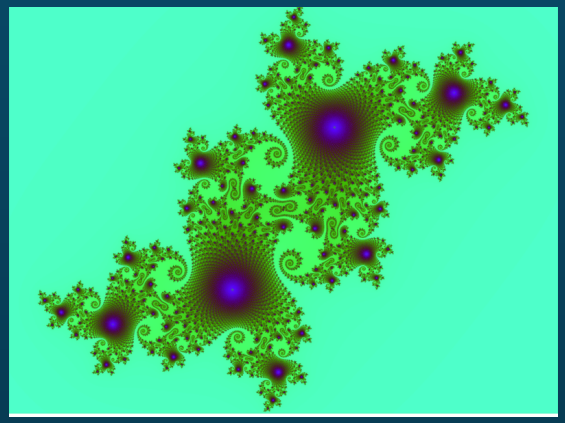
(Davis & Sumara, 2006)

self-organizing,
self-determining,
far-from-equilibrium,
decentrally networked,
nested,
recursively elaborate,
scale independent



Nested Systems of Learning

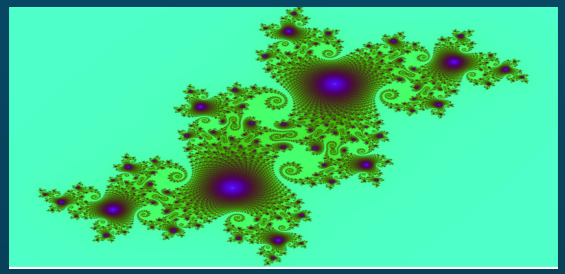




Theoretical Perspective: Complexity Thinking

(Davis & Sumara, 2006)

- Learning is a process of adaptations
- Teaching is about creating conditions for emergence to occur
- Conditions for emergence include:
  - enabling constraints
  - trans-level learning
  - specialization



Learning Potentials of Technologies

Tools and Devices	Learning Potentials (Clark et al., 2009)	Learning Potential (Complexity Thinking)
Talk, chat, communication over a distance	Inter- and cross-institutional collaboration, tutor and peer support networks, dialogue with external experts	• Builds redundancy within the system • Promotes a more decentralized system • May allow for self organization
Share photos, share personal profiles, share an online diary	Learner showcase, peer review and feedback, learning journals, online narratives (extended audience)	• Neighbour interactions • Diversity of expression • Emergence of far from equilibrium state

Objectives

- Study students' and teachers' use of social media for learning science across age groups and contexts
- Develop a model for understanding science learning through social media
- Make recommendations for the use of social media for instructional practice

The Study

Phase 1

- Focus groups with students
- Focus groups with teachers

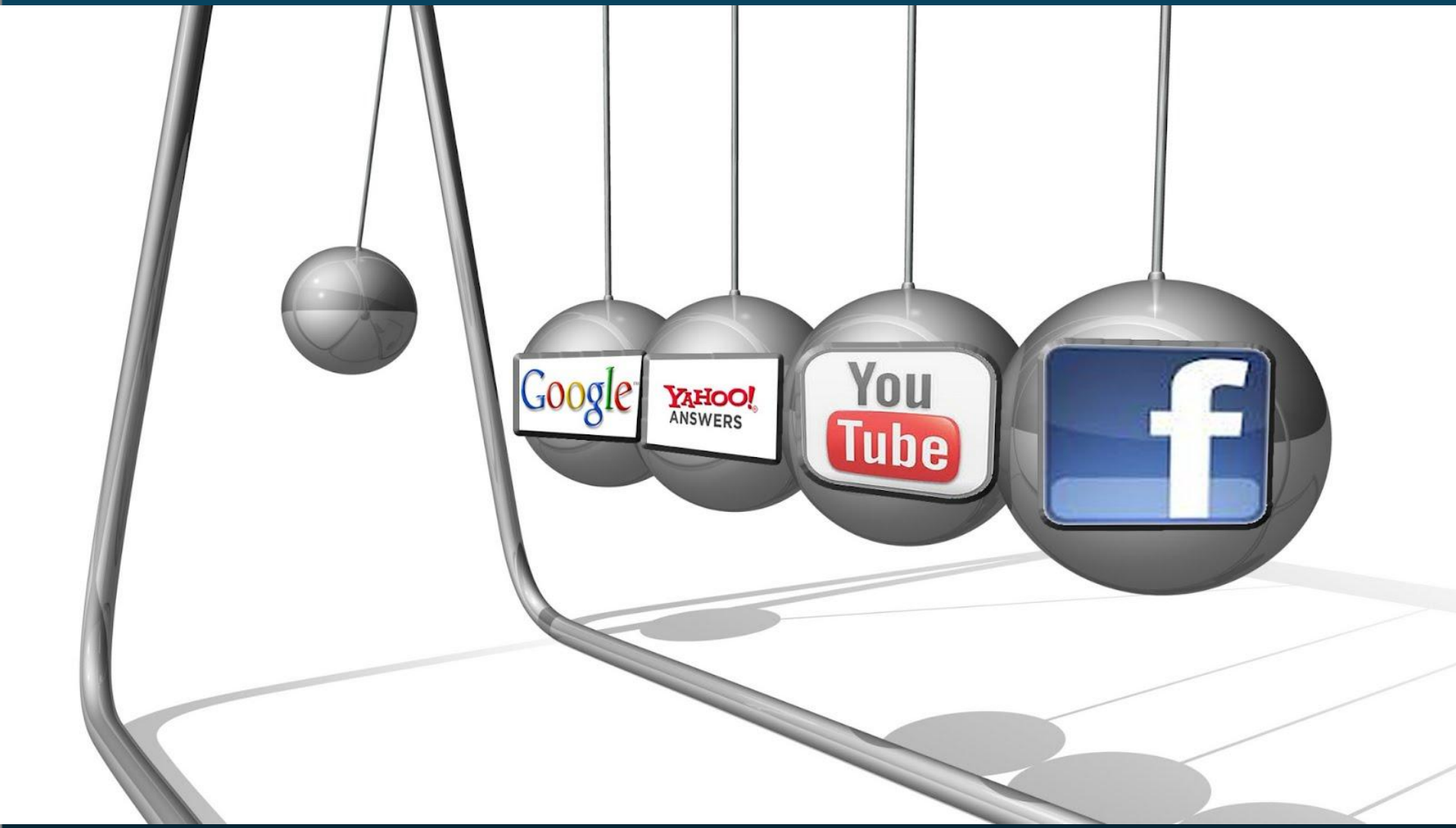
Phase 2

- Surveys of students

Phase 3

- Case studies of science learning with social media

Phase 1: Exploring Student Social Media Use



Research Question

What social media resources do secondary and post-secondary students draw on as they learn science? How and Why?

Physics Focus Groups

- secondary students (groups=5; n=24)
- first year post-secondary students (groups=2; n=7)
- upper year post-secondary students (groups=2; n=3)

Results: 3 Main Themes

- Use of social media tools
- Personalized physics learning
- Teachers and social media use

Students' Social Media Use

Technology	Code Frequency
Facebook	54
Videos (i.e., Youtube)	38
Online forums (i.e., Yahoo Answers)	34
Google	27
Wikipedia	15

Facebook

Students used facebook, text, and online chat clients more than email.

I still have to check it [my email] sometimes because my teachers like using it. [HS student]

iMessage

2011 -04-04 1:06 PM

When I get a message on Facebook...I feel like I have a responsibility [to respond]. It's almost like when I'm talking to someone at a party. [upper year post-secondary]

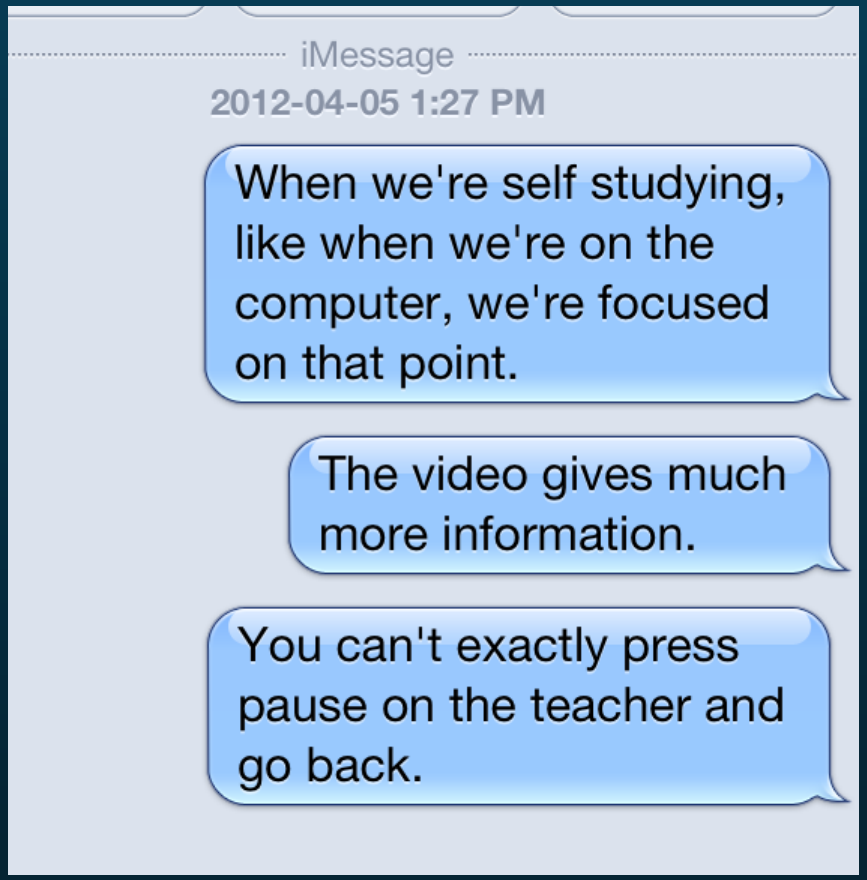
Facebook

Students named Facebook most frequently when they were asked about the types of social media they would like their teachers to use:

I think it would be cool if they had like a Facebook, you could just talk to them anytime you want kind of thing. And it's a lot quicker than email. And you wouldn't have to wait for them. [first year post secondary student]

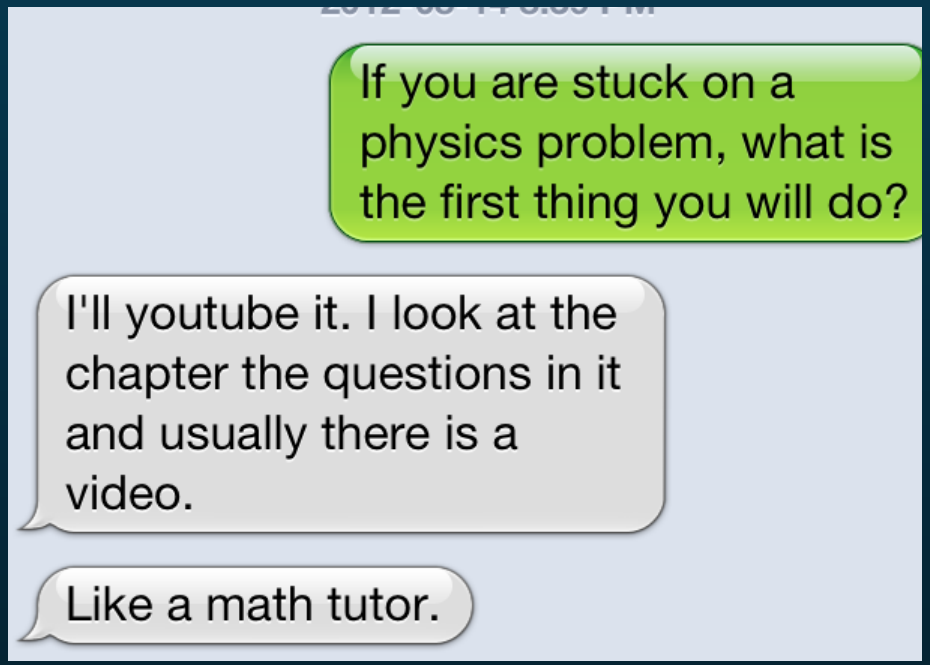
Videos

Videos were a heavily accessed social media resource.

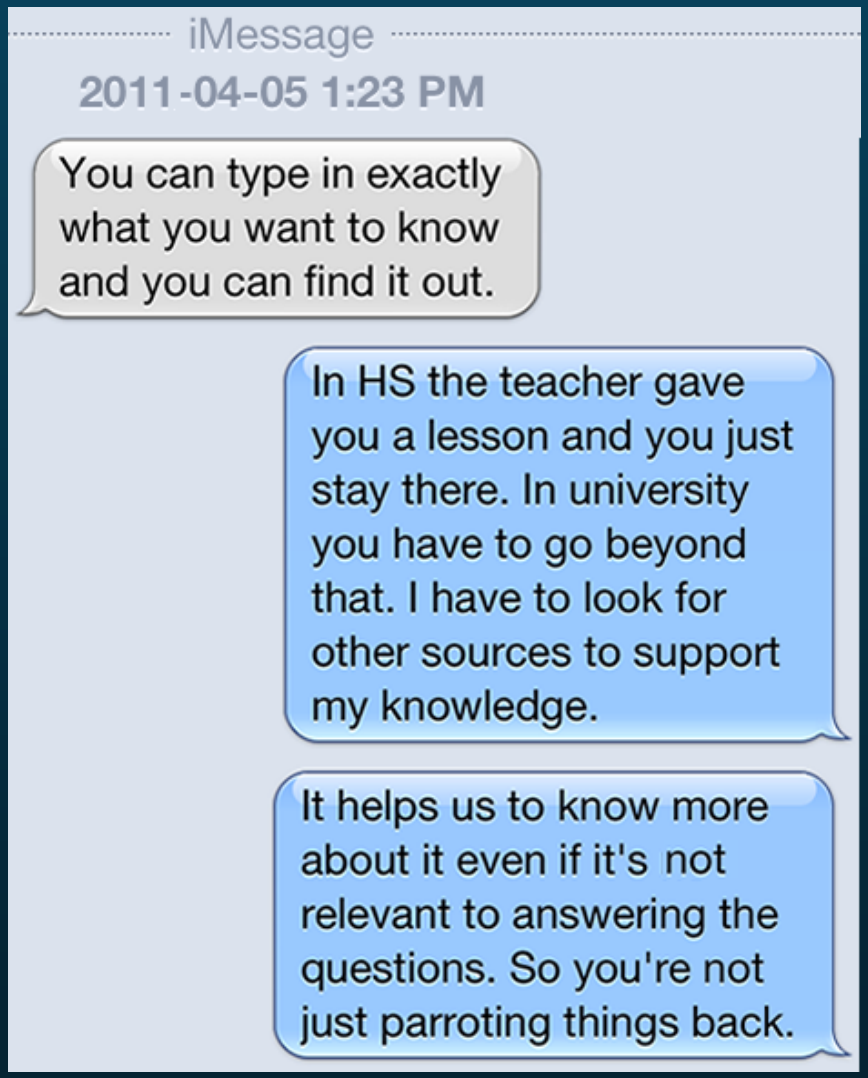


Videos

Secondary students were more likely to say they used videos when they struggled with a physics problem:



Online Forums



Students used online discussion forums--but in different ways.

Personalized Physics Learning

Students used a diversity of social media tools to personalize learning for their context.

iMessage

2011-04-05 1:23 PM

It [the Internet] makes the topic more interesting. If I were to be going off of the Physics I learned from HS, I probably wouldn't do physics at all [at university]. But the university stuff [and] the Internet is much more interesting.

Teachers' Social Media Use

Students in all age groups agreed that their teachers did not frequently use social media as teaching tools.

Conclusions

- Student use of social media tools was wide ranging and ubiquitous, but not creative and collaborative.
- Teaching & learning require support for
  - social media use
  - shifting traditional models

Conclusions

Social media

- can create personalized learning spaces
- can be used to improve communication between students and teachers
- was used differently by secondary and post secondary students

Future Work

- Teacher focus groups
- Develop survey for post-secondary 1st year students
- Identify case studies of effective social media use in science learning contexts

Acknowledgements

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Canada

Thank you for your attention.
Presentation will be shared--check @rfmoll.

Questions or Comments?

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