Disciplinary Literacy Research and Practice in the U.S. and in Nordic Countries

William G. Brozo
George Mason University, USA

Sari Sulkunen
University of Jyväskylä, Finland

European Conference on Literacy, Copenhagen, 5 August 2019
Historical context for Disciplinary Literacy in the U.S.

• At least 100 years of applied research in the area of reading within subject areas
  • William S. Gray (1919) – generic reading skills would transfer to specific subject areas

• Solid knowledge base in content literacy has been established

• Content literacy strategies have become endemic to pedagogical practice and are specifically identified in district and state curricula

• Shift to disciplinary literacy has been challenging to the longstanding tradition of content literacy
Disciplinary literacy research trends in the U.S.

- Defining literacy within disciplinary boundaries
- Role of digital tools
- Collaboration
- Teacher education
- Professional development
- Role of content area literacy
Defining literacy within disciplinary boundaries

• Project READI - Reading, Evidence and Argumentation in Disciplinary Instruction
  • reading for understanding in authentic learning situations within a discipline
  • disciplines as communities of practice
  • researchers collaborate with teachers to design discipline-specific interventions in the subject areas

• Teams of diverse professionals conducted conceptual meta-analyses of literature, history, and science to determine types of knowledge critical to comprehending, constructing, and conveying evidence-based arguments from multiple sources of information within each of these three disciplines

Source
Defining literacy within disciplinary boundaries

**Literary Reading**
- Establish criteria for judging interpretive claims and arguments that address author generalizations, explaining how the text meets the criteria and justifies the claim.
- Justifications may be drawn from the text; from other texts, literary constructs or critical traditions; or from the reader’s judgments from experience in the world.

**Science**
- Justify explanations using science principles, frameworks and enduring understandings, cross-cutting concepts, and scientific evidence (Includes evaluating the quality of the evidence.)
- Critique explanations using science principles, frameworks and enduring understandings, cross-cutting concepts, and scientific evidence.

**History**
- Construct claim-evidence relations, using textual evidence and explaining the relationship among the pieces of evidence and between the evidence and claims.
- Use interpretive frameworks developed by historians, such as societal structures, systems, and patterns across time and place, to analyze historical evidence and argument and to address historical questions.
- Evaluate historical interpretations for coherence, completeness, the quality of evidence and reasoning, and the historian’s perspective.

From Goldman et al., 2016
Role of digital tools

• Exploring disciplinary experts’ use of digital tools for acquiring, analyzing, and disseminating knowledge
• Employing applications of digital tools with students for disciplinary learning

Sources


Collaboration

• Exploring optimal approaches for exchanging knowledge
  • Between disciplinary experts and literacy professionals
  • Between subject-area teachers and disciplinary experts

Sources


Teacher preparation

• Exploring university’s role in fostering disciplinary literacy mindset and practices among pre-service teachers
• New teacher education candidates who are not familiar with content literacy may find disciplinary literacy approaches easier to adopt

Sources

Professional learning

• Exploring ways of supporting in-service teachers’ transition to disciplinary literacy-based pedagogy

• Thought by some to meet less resistance than to content area reading since disciplinary literacy foregrounds teachers’ domain knowledge and exploits literacy practices endemic to disciplinary inquiry

Sources


Role of content area literacy

• Exploring whether and how content literacy strategies and disciplinary literacy practices articulate
  • Generic content literacy strategies **fade in importance** as students progress through the grades
  • Generic strategies actually **hinder effective reading, thinking, and problem solving** by drawing students’ attention away from the required mental operations needed for specific disciplinary tasks
  • Content literacy strategies remain **critical to successful achievement** in the disciplines **for learning disabled and struggling readers**
  • Content literacy strategies are considered **useful “engineering tools”** situated within the work of engaging in disciplinary reading and writing practices
  • Generic literacy practices **can be adapted to further learning** within disciplinary domains
Sources


Nordic traditions and developments

• In the Nordic countries both CAL and DL in education and research
  ➢ Content-area literacy with a linguistic and literacy approach
  ➢ More recent emphasis on disciplinary literacy in relation to
  disciplinary thinking and knowledge construction
    • Subject-specific didactics
Nordic traditions and developments

• In Sweden, Norway, and Denmark several studies on subject area textbooks, their language & other textual characteristics, literacy practices and reading strategies needed
  • E.g. in science, literature, chemistry, mathematics, history (e.g. Brenholm, 2014; Bommarco 2006, Ekvall 2011, Kabel, 2009; Olofsson 2010)
  • Also struggling readers and L2-students in focus (Olvegård 2014, Reichenberg & Lundberg 2011)
  • Studies also on text-talk in upper secondary education (e.g. Hallesson 2015, Tengberg 2011, Visén 2015)
  • Genre-pedagogy (Liberg 2009; 2016 theme issue in Sprogforum, the DanishTidsskrift for sprog- og kulturpaedagogik; 2016, vol. 63)
Nordic traditions and developments

• In Finland, several studies in several school subjects on different grades emphasizing the integrated nature of content and language & literacy
  • For primary school students, in the framework of language awareness in education (languaging) (e.g. Hähkiöniemi et al. 2015)
    • also about content-area reading (Merisuo-Strom & Aerila 2016)
  • For secondary school students, studies conducted in the framework of disciplinary literacy (e.g. Kouki & Virta 2015; Rantala & van den Berg 2013; Sulkunen & Saario 2019; Veijola & Mikkonen 2015; Yli-Paunula et al. 2015)
  • CLIL studies: content and language integrated learning (e.g. Nikula 2015)
  • Language learners and their challenges in subject area meaning construction (e.g. Saario 2012)
Nordic traditions and developments

Disciplinary literacy present also in curricula for the basic education:

• Finnish history curriculum emphasizes "critical stance towards historical knowledge produced by various actors", "capability to read and analyze - - source materials and make supportable interpretations of their purpose and meaning”

• Swedish curriculum for basic education stresses the ability to "critically interpret and evaluate source materials in order to build historical knowledge”

• Danish curriculum for basic education includes subject-specific competence goals, e.g. in history students are expected to ”formulate historical problems, search and select sources, analyze the sources, propose solutions and use disciplinary concepts and language in communicating their work” (freely translated by S.S.)
Sources


• Danmarks laeringsportal: Fælles Mål for faget historie. Available at: https://www.emu.dk/grundskole/historie/faelles-mal


Sources


Examples of disciplinary literacy teaching practices from the U.S. & Nordic contexts
Inquiry-based history learning in a Finnish upper secondary school

• One school-week long project during which students worked in groups to answer to the question:
  • Who possibly tried to assassinate President of Finland, Urho Kekkonen, in summer 1957?

• Multiple text sources:
  • Research literature & Internet sources
  • Primary sources from archives, e.g. a page from the president’s adjutants’ weekly log; text by the president’s daughter-in-law who, present at the time of the event, described it in an emotional tone

• Guidance in knowledge construction practices:
  • Students were instructed to read the texts and consider their relevance and reliability as evidence of the historical event
  • Students were challenged to ponder how authors’ intentions might have influenced the texts and how to contextualize different kinds of sources


Examples of disciplinary literacy practices from the U.S. & Nordic contexts

• Across Disciplines
  • Disciplinary Expert in Residence Approach
    • Similar to artist and poet in residence
    • 1 day per week for a “grading period”
    • Schools “adopt” a professional mathematician, scientist, historian
    • Disciplinary expert works collaboratively with teachers of maths, science, history to ensure the actual material, social, and cognitive practices of disciplinary expertise are incorporated into the teachers’ instructional methods and textual practices
  • Provide small group PD in collaboration with literacy specialist
Examples of disciplinary literacy practices from the U.S. & Nordic contexts

• Maths

Problem:
Old McDonald is counting the number of chickens and pigs on his farm. Oddly, he decides to tally only the heads and legs of these animals. When he has finished, he has counted 30 heads and 70 legs. How many chickens and pigs does Old McDonald have?

Examples of disciplinary literacy practices from the U.S. & Nordic contexts

**Disciplinary literacy goals:**

- Use stated assumptions, definitions, and previously established results in constructing arguments
- Build a logical progression of statements to explore the truth of conjectures and to justify conclusions
Examples of disciplinary literacy practices from the U.S. & Nordic contexts

Maths

- Math writing that require students to explain reasoning and to justify results
- Writing approach developed by the teacher emerged logically from the algebraic processes under study
- Instead of relying on a generic content area writing strategy, the teacher created this unique, discipline-specific writing activity because it more closely fit the math content and processes as well as her goal to link students’ communication skills to mathematical thinking

---

Communicate how you arrived at your conclusion using mathematical language. Make an argument for why this was the best way to solve the problem.

I used the information given in the original problem to formulate an equation. I had to use some background knowledge about these two types of animals, specifically, I had to know how many legs each had. This was a faster way to solve the problem than drawing out the options or guess and check. If I were going to do it again, I might define the number of chickens based on the number of pigs because the math would be easier.

<table>
<thead>
<tr>
<th># pigs x 4 = # of pig legs</th>
<th>0 x 4 = 0</th>
<th>1 x 4 = 4</th>
<th>2 x 4 = 8</th>
<th>3 x 4 = 12</th>
<th>4 x 4 = 16</th>
<th>5 x 4 = 20</th>
</tr>
</thead>
<tbody>
<tr>
<td># chickens x 2 = # chicken legs</td>
<td>30 x 2 = 60</td>
<td>29 x 2 = 58</td>
<td>28 x 2 = 56</td>
<td>27 x 2 = 54</td>
<td>26 x 2 = 52</td>
<td>25 x 2 = 50</td>
</tr>
<tr>
<td>Total legs</td>
<td>O + 60 = 60</td>
<td>4 + 58 = 62</td>
<td>8 + 56 = 64</td>
<td>12 + 54 = 66</td>
<td>16 + 52 = 68</td>
<td>20 + 50 = 70</td>
</tr>
</tbody>
</table>

---

Brozo-Sulkunen-2019
### Examples of disciplinary literacy practices from the U.S. & Nordic contexts

#### Word Grid – generic content literacy strategy adapted for learning discipline-specific information in science

<table>
<thead>
<tr>
<th>Source of food-borne illness</th>
<th>Infection</th>
<th>Intoxication</th>
<th>Aerobic</th>
<th>Anaerobic</th>
<th>Time symptoms begin</th>
<th>Most likely food source</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridium perfringens</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>4-22 hours</td>
<td>Foods served at large buffet-type gatherings</td>
<td>Keep hot foods hot; refrigerate uneaten foods promptly</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>1-7 hours</td>
<td>Moist meat dishes, starchy foods</td>
<td>Refrigerate uneaten foods immediately</td>
</tr>
<tr>
<td>Clostridium botulinum</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>12-24 hours</td>
<td>Improperly processed home-canned foods (especially low-acid types)</td>
<td>Boil home-canned foods; do not give infants raw honey</td>
</tr>
</tbody>
</table>

**Source:** Brozo-Sulkunen (2019)
Lingering Concerns & Future Directions

• Easier to theorize/conceptualize than operationalize disciplinary literacy curricula

• Research evidence in support of unique disciplinary literacy practices is slowly accruing

• More systematic investigations are needed to determine the impact of disciplinary literacy practices on student learning and engagement relative to content literacy or other approaches; and on teachers’ skills and self-efficacy

• Healthy debate should continue that focuses on:
  • whether students should be disciplinary specialists or interdisciplinary generalists
  • If/how disciplinary literacy cultures can be realized in schools with teachers who are not disciplinary experts
Thank You!

wbrozo@gmu.edu  sari.sulkunen@jyu.fi
@WilliamGBrozo  @sari_sulkunen