

Thesis Workshop 2

Maxi-Ann Campbell

1

Review the Given-New Principle in academic writing for increasing reader comprehension

2

Compare and contrast the source integration techniques used in chemical engineering bachelor's theses and other fields

3

Reflect on methods of incorporating sources into your text and when you might use each type

Workshop Learning Outcomes

Check-In

Introduce yourself.

What is your thesis topic?

What have you worked on since workshop 1?

What challenges are you currently facing?

How are you addressing those challenges?

Review

Review the three types of given-new structures



Practice

Identify the Given-New Structure
Review methods for restating a topic

Given-New
Principle

A. Constant Topic

FAMILIAR

NEW

¹...hydrogen tanks are made from...



²...these systems carry...



³...the tank must have...



⁴... the tanks must be made from....



⁵These tanks are also quite large...

¹Compressed hydrogen tanks are made from a strong but lightweight material such as carbon fiber. ²Currently, these systems carry about 5,000 pounds per square inch of hydrogen, but the goal is 10,000 psi to improve vehicle range. ³For safety purposes, the tank must have a burst strength at least twice the pressure of the fuel. ⁴Thus, the tanks must be made from materials that are either very heavy or very expensive. ⁵These tanks are also quite large, creating packaging problems in the vehicles.

B. Step-wise Topic

.¹Solid organic waste is fed into a coarse *shredder* and cut into pieces. ²The **shredded pieces** are more finely ground into a paste before being *mixed* with manure and bio-sludge. ³The **mixture** is transported to a primary mixing tank where it is undergoes a *homogenization process*. ⁴The **homogenized biomass** is pumped into two *pasteurization tanks*, where it is held at 70 °C for one hour to produce a bacteria-free *slurry*.

⁵The **pasteurized slurry** enters a digester where it undergoes *methane fermentation* at 38 °C for 20-24 days. ⁶The **fermentation process** yields *methane* at concentrations as high as 60-70%. ⁷This **biogas** is recovered and used for generating power at the power generation facility, and the **digested slurry** is returned to the farmers as organic fertilizer.

¹waste ... **shredder** and cut into pieces.

²The **shredded pieces** ... **mixed** with manure and bio-sludge.

³The **mixture** ... a **homogenization** process.

⁴The **homogenized biomass** ... **pasteurization** tanks...

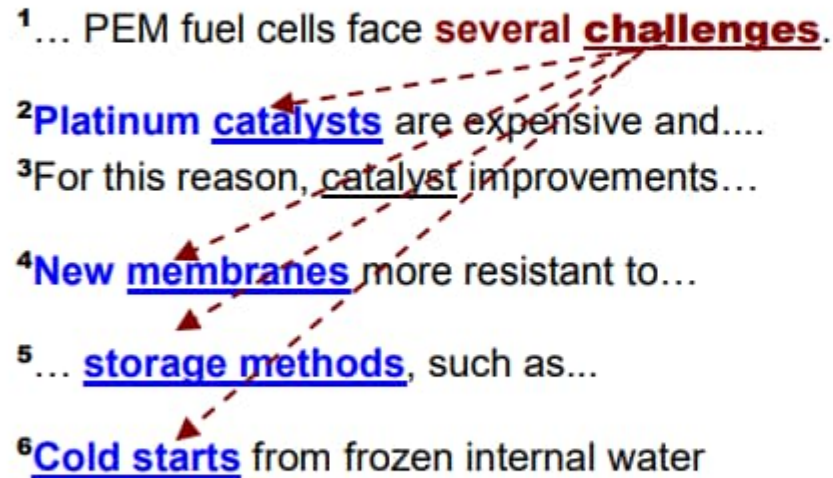
⁵The **pasteurized slurry** ... *methane* **fermentation**...

⁶The **fermentation** process yields...

C. Hypertopic

FAMILIAR

NEW

- ¹... PEM fuel cells face **several challenges**.
 - ²Platinum catalysts are expensive and....
 - ³For this reason, catalyst improvements...
 - ⁴New membranes more resistant to...
 - ⁵... storage methods, such as...
 - ⁶Cold starts from frozen internal water
- 

¹Proton exchange membrane (PEM) fuel cells face **several challenges**. ²Platinum catalysts are expensive and also subject to CO poisoning from hydrocarbon fuels. ³For this reason, catalyst improvements, non-precious metal catalysts and other alternatives are currently under intensive investigation. ⁴New membranes more resistant to chemical impurities are also being developed. ⁵Alternative storage methods, such as metal hydrides and carbon nanostructures, may address hydrogen storage limitations that have prevented fuel cell cars from achieving a typical driving range (300-400 miles/tank). ⁶Cold starts from frozen internal water are improving, though the DOE's goal of cold starts at -20°C in 30 seconds or less has yet to be achieved.

Activity A

Complete Task 5 (A –E)

Complete Task 6 (A and B)

Activity B

Methods of Integrating Sources

Non-integral (Excerpt 1, Version A)

Integral (Excerpt 1, Version B)

Reference numbers (Excerpt 2, Version A)

Footnotes or endnotes

Summary / Generalization

Quote

Table 2: Surface forms of citations (%)

Discipline	Non-integral	Integral
Biology	90.2	9.8
Electronic Engineering	84.3	15.7
Physics	83.1	16.9
Mechanical Engineering	71.3	28.7
Marketing	70.3	29.7
Applied Linguistics	65.6	34.4
Sociology	64.6	35.4
Philosophy	35.4	64.6
Overall Averages	67.8	32.2

Ken Hyland. (1999). Academic Attribution: Citation and the Construction of Disciplinary Knowledge. *Applied Linguistics* 20/3: 341±367

Table 4: Reporting forms in citations

Discipline	Reporting structures		Most frequent forms
	per paper	% of citations	
Philosophy	57.1	67.0%	say, suggest, argue, claim, point out, propose, think
Sociology	43.6	42.0%	argue, suggest, describe, note, analyse, discuss
Applied Ling.	33.4	44.4%	suggest, argue, show, explain, find, point out
Marketing	32.7	34.5%	suggest, argue, demonstrate, propose, show
Biology	26.2	31.7%	describe, find, report, show, suggest, observe
Electronic Eng.	17.4	40.6%	propose, use, describe, show, publish
Mechanical Eng.	11.7	42.5%	describe, show, report, discuss
Physics	6.6	27.0%	develop, report, study
Averages	28.6	42.6%	suggest, argue, find, show, describe, propose, report

Ken Hyland. (1999). Academic Attribution: Citation and the Construction of Disciplinary Knowledge. *Applied Linguistics* 20/3: 341±367

Table 3: Presentation of cited work (%)

Discipline	Quote	Block quote	Summary	Generalization
Biology	0	0	72	38
Electronic Engineering	0	0	66	34
Physics	0	0	68	32
Mechanical Engineering	0	0	67	33
Marketing	3	2	68	27
Applied Linguistics	8	2	67	23
Sociology	8	5	69	18
Philosophy	2	1	89	8

Ken Hyland. (1999). Academic Attribution: Citation and the Construction of Disciplinary Knowledge. *Applied Linguistics* 20/3: 341±367

- Depending on the intended application, membranes can be hydrophilic or organophilic [4], [5], [6], [7]. As hydrophilic membranes, is employed for dehydration of organic mixtures [7] and on other hand organophilic membrane used in ether removal of organics from diluted stream [8] or in Acetone butanol-ethanol fermentation process [9].
- Recently, Kamtsikakis et. al, developed nanocomposite membrane using high aspect ratio CNF with nonpolar polystyrene-block-polybutadiene-block-polystyrene matrix for ethanol/water pervaporation dehydration. In their study, on 15 wt.% CNF addition in membrane (60~80 μm) resulted highest mechanical properties with 3-fold increase in flux accompanied by 40 % decreased in separation factor giving a highest pervaporation separation index ($89.4 \text{ g m}^{-2} \text{ h}^{-1}$) was observed [25].

<https://doi.org/10.1016/j.cep.2022.109046>

Chemical Engineering Journal Article

- The most widely known definition of sustainable development, which has been used as the basis for innumerable number of definitions because its openness and wide range of possible interpretations, is that given in the Brundtland Report in 1987: 'Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs' [2]. Liverman et al. went beyond this definition, and defined "... sustainability to be the indefinite survival of the human species (with a quality of life beyond mere biological survival) through the maintenance of basic life support systems (air, water, land, biota) and the existence of infrastructure and institutions which distribute and protect the components of these systems" [8].

<https://doi.org/10.1016/j.cej.2007.02.028>

Chemical Engineering Journal Article

Avoid Paragraph- final Citations

- To ensure that the reader knows *exactly* what information comes from the source:
 1. Open the paragraph with a lead-in sentence or topic sentence that introduces the source you are summarizing or paraphrasing.
 2. In the sentences that follow, refer back to the source when needed to show that you are still using the same source.
- According to Spitzer's (2010) study on the effects of radiation on humans ...Spitzer's study developed the guidelines needed to test...The most important find in his study was that....Spitzer concluded the benefit of radiation...The evidence that proves these guidelines...(Spitzer, 2010).

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Chemical Engineering Journal Article

Gonzalez et al. (2012) uses a modified version of NREL's MAS pathway model to quantify the pathway's techno-economics under five lignocellulosic feedstock scenarios: loblolly pine, natural hardwood, eucalyptus, stover, and switchgrass. A TPI of \$284 million is calculated for a 1295 MTPD biorefinery. The analysis calculates both NPV and IRR for each feedstock scenario under the assumption that the biorefinery receives \$4.64/gge (\$1.23/lge) of ethanol and operates for 15 years. The stover and switchgrass scenarios yield the lowest returns (\$38 million/14.2% and \$84 million/16.5%, respectively) while the pine scenario yields the highest returns (\$192 million/21.4%). The authors attribute the different results to the composition, moisture content, and alcohol yield associated with each feedstock.

Writing a paragraph on one citation: hypertopic

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Writing a paragraph on one citation: hypertopic

3.2.1. Fast pyrolysis and hydroprocessing

One of the earliest TEAs of the fast pyrolysis pathway is provided by [Bridgwater \(1996\)](#), which calculates that the MFSP of diesel fuel produced via FPH is 158% higher than the contemporary diesel fuel market price. The analysis presents MFSPs for several scenarios involving different process and upgrading configurations, including catalytic upgrading, but provides relatively few details on capital costs. Furthermore, its conclusion that the FPH pathway cannot compete with petroleum is largely driven by its use of a \$20/bbl petroleum price that, while appropriate at the time, is much too low for current comparisons.

Writing a paragraph on one citation: constant topic

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What are the author's own views on the matter?

Whose
voice is
this?



The voice of the
scientific community

Shared / common
knowledge?



The voice of the cited source and its
author(s)?



The author's own voice?

Methods of Integrating Sources

Discuss in groups:

1. When have you used one of these source integration methods in your thesis?
2. What are the benefits or disadvantages of each method?
3. After this textual analysis, are there any changes you might make to how you incorporate sources in your thesis?
4. How might you utilize the Given-New Principle to make clear when you are writing about one source?

Non-integral

Integral

Reference numbers

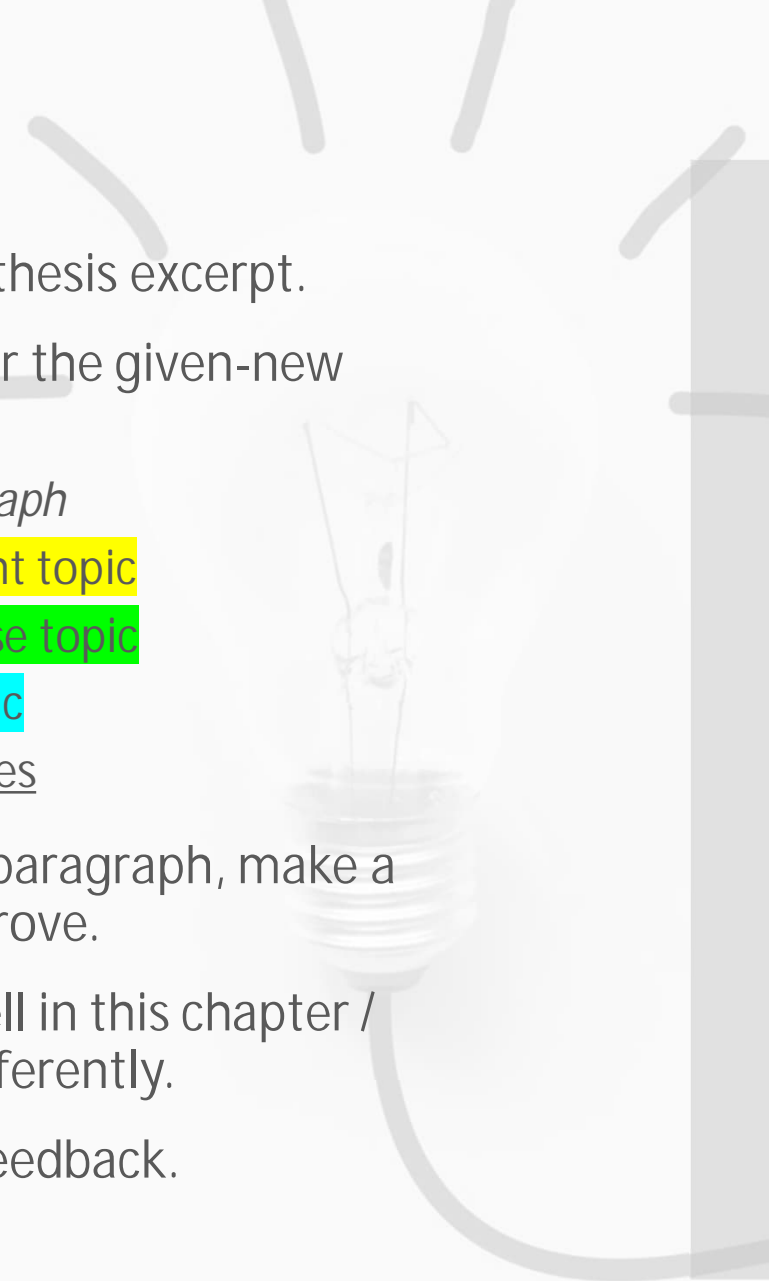
Footnotes or endnotes

Summary / Generalization

Quote

Peer Review

1. Read the first two pages of your peer's thesis excerpt.
2. On their text, look at each paragraph for the given-new principle:
 - *Italicize the topic sentence of the paragraph*
 - Highlight in yellow if they use a constant topic
 - Highlight in green if they use a step-wise topic
 - Highlight in blue if they use a hypertopic
 - Underline transitional words and phrases
3. If they have no clear flow in the text or paragraph, make a recommendation for how they can improve.
4. State one thing the author has done well in this chapter / section, and one thing you might do differently.
5. If time, you can begin discussing your feedback.





How have you incorporated sources throughout your thesis?



How might your incorporation of sources change in different parts of your paper?



Does each paragraph of your text utilize one of the methods for given-new information flow?



How can you use this principle to help you make clear who is “speaking” throughout your text?



What have you learned from reading you peer’s thesis excerpt?

To Consider