



Comparative Judgement Learning Activities in Higher Education: Insights from a Scoping Review

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A scoping review of comparative pedagogical practices



- ▶ Pedagogical Use of Comparison in Higher Education – A Scoping Review [under review]
with Catherine Delfosse, Nancy Durieux, Françoise Jérôme and Dominique Verpoorten
- ▶ Aim: Identifying and describing different sets of Comparative Pedagogical Practices in Higher Education



- ▶ JBI methodology for scoping reviews (Aromataris & Munn, 2020)
- ▶ Two concepts: « pedagogical use of comparison » and « higher education »
- ▶ 12 initial notions: analogy, case comparison, comparative judgement, comparison process, contrasting cases, interleaving, metaphor, similarities & differences, simile, variation theory, Venn diagrams



Ovid MEDLINE(R) ALL <1946 to February 19, 2024>

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1      exp Schools/      149463
2      ((postsecondary or "post secondary" or tertiary or
"third level" or "post high school" or graduate or
undergraduate or postgraduate or master* or bachelor* or
doctoral or postdoctoral) adj3 (stud* or education or training or
school* or degree* or program*)).ti,ab,kf.      93136
3      "higher education".ti,ab,kf. 21751
4      college*.ti,ab,kf. 155758
5      universit*.ti,ab,kf. 488678
6      ((simile* or analog* or "variation theor*" or "theor* of
variation*" or "case comparison*" or "comparative judg*ment*"
or "comparison process*" or "contrast* case*" or interleav* or
metaphor* or "venn diagram*" or (similar* adj2 differen*)) adj6
(learn* or teach* or pedagog* or educat*)).ti,ab.      1568
7      1 or 2 or 3 or 4 or 5      787294
8      6 and 7 176
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- 5 databases (20 Feb 2024)
ERIC (Ovid), Scopus, Embase,
MedLine (Ovid) & PsycINFO
(Ovid)

Figure 1. Search strategy on MedLine

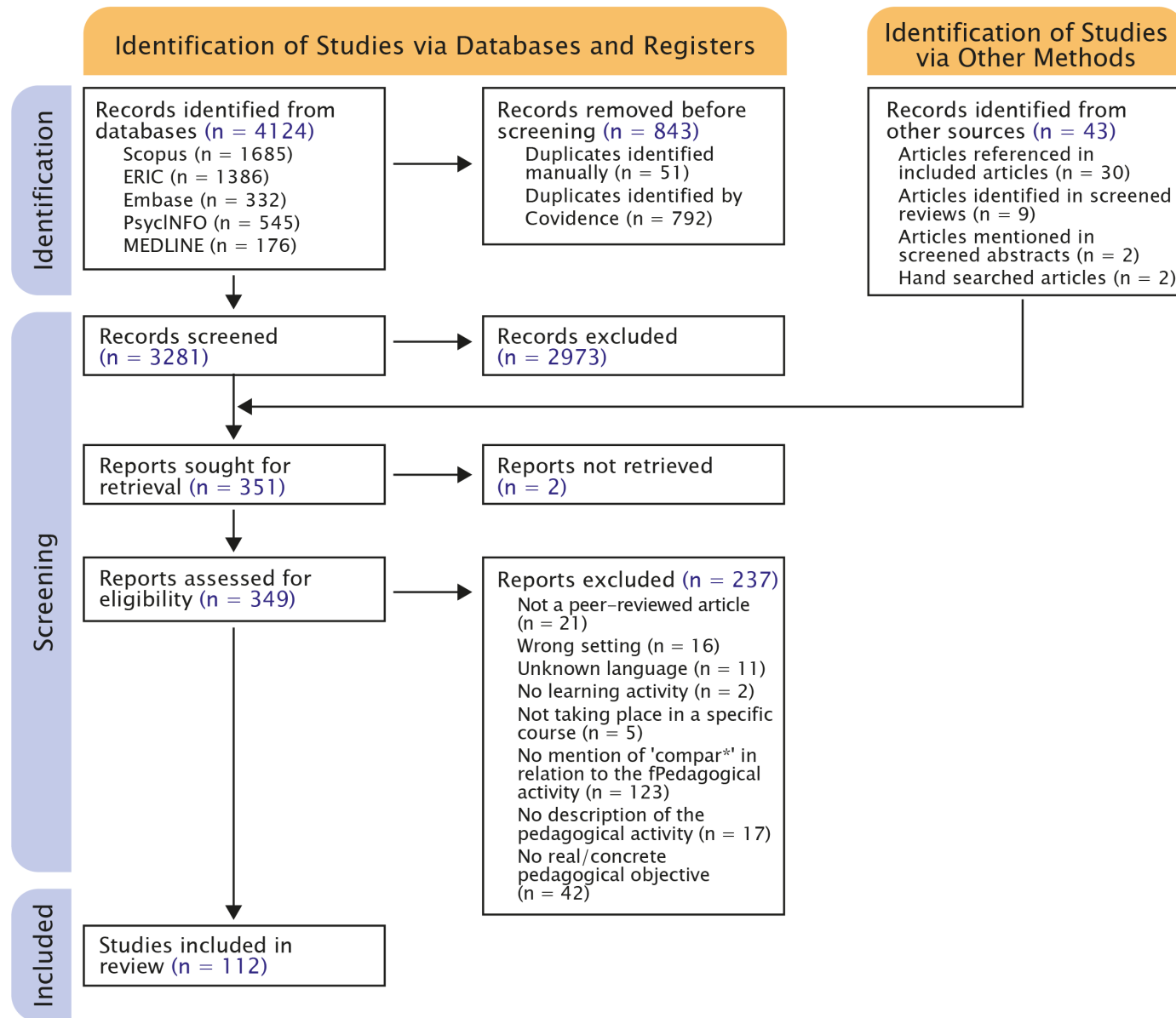


Figure 2. PRISMA 2020 Flow Diagram

5 Comparative Pedagogical Practice genres



	Analogy	Metaphor	Comparative judgement	Variation theory	Venn diagram
Percentage of included studies	65.18	32.14	7.14	5.36	3.57
First published article	Since 1975	Since 1988	Since 2017	Since 2009	Since 1983

8 CJ papers describing 11 different CJ activities



- Bartholomew, S. R., Mentzer, N., Jones, M., Sherman, D., & Baniya, S. (2022). Learning by evaluating (LbE) through adaptive comparative judgment. *International Journal of Technology and Design Education*, 32(2), 1191–1205.
- Bartholomew, S. R., Zhang, L., Garcia Bravo, E., & Strimel, G. J. (2019). A tool for formative assessment and learning in a graphics design course: Adaptive comparative judgement. *The Design Journal*, 22(1), 73–95.
- Bouwer, R., Lesterhuis, M., Bonne, P., & De Maeyer, S. (2018). Applying Criteria to Examples or Learning by Comparison: Effects on Students' Evaluative Judgment and Performance in Writing. *Frontiers in Education*, 3, 86.
- Huber, S., Bosman, L., & Bartholomew, S. (2021). Library Instruction and Adaptive Comparative Judgment to Foster Visual Literacy Skills. *Portal: Libraries and the Academy*, 21(1), 149–169.
- Potter, T., Englund, L., Charbonneau, J., MacLean, M. T., Newell, J., & Roll, I. (2017). ComPAIR: A New Online Tool Using Adaptive Comparative Judgement to Support Learning with Peer Feedback. *Teaching & Learning Inquiry*, 5(2), 89–113.
- Rhind, S. M., Hughes, K. J., Yool, D., Shaw, D., Kerr, W., & Reed, N. (2017). Adaptive Comparative Judgment: A Tool to Support Students' Assessment Literacy. *Journal of Veterinary Medical Education*, 44(4), 686–691.
- Seery, N., Buckley, J., Delahunty, T., & Canty, D. (2019). Integrating learners into the assessment process using adaptive comparative judgement with an ipsative approach to identifying competence based gains relative to student ability levels. *International Journal of Technology and Design Education*, 29(4), 701–715.
- Strimel, G. J., Bartholomew, S. R., Purzer, S., Zhang, L., & Ruesch, E. Y. (2021). Informing engineering design through adaptive comparative judgment. *European Journal of Engineering Education*, 46(2), 227–246.



sadler
kimbell
bartholomew
pollitt jones
thurstone
seery
canty
bramley

Figure 3. Theoretical background of CJ studies.
Note. $N = 8$. The size and colours represent the frequency a word appeared in the corpus. The corpus is the totality of authors cited in studies using comparative judgement to describe their CPP. Each word that has a frequency > 2 is represented. When one author was cited multiple times in the same study, it was considered as one occurrence. When there were several co-authors in a reference, only the first one was considered.



Intergroup Comparison of Disciplines in which the CPPs Were Implemented

Disciplines	Analogy ^a		Metaphor ^b		Comparative judgement ^c		Variation theory ^d		Venn diagram ^e	
	No.	%	No.	%	No.	%	No.	%	No.	%
Natural Science	36	37.5	4	7.84	2	18.18	7	70	1	25
Medical Science	17	17.71	14	27.45	1	9.09	0	0	2	50
Applied Science	17	17.71	5	9.8	6	54.55	0	0	0	0
Social Science	17	17.71	20	39.22	0	0	3	30	0	0
Humanities	7	7.29	8	15.69	2	18.18	0	0	1	25
Multiple	2	2.08	0	0	0	0	0	0	0	0

Note. Each column represents one of the five CPP genres, with cells displaying counts and percentages of occurrences across academic disciplines. Bolded values indicate the mode within each genre.

^a*N* = 96. ^b*N* = 51. ^c*N* = 11. ^d*N* = 10. ^e*N* = 4.



Intergroup Comparison of Academic Levels in which the CPPs Were Implemented

Academic levels	Analogy ^a		Metaphor ^b		Comparative judgement ^c		Variation Theory ^d		Venn Diagram ^e	
	No.	%	No.	%	No.	%	No.	%	No.	%
Undergraduate/Bachelor	60	62.5	24	47.06	10	90.91	7	70	2	50
Graduate/Master	5	5.21	7	13.73	0	0	0	0	0	0
Post-graduate/Doctoral	2	2.08	2	3.92	0	0	0	0	0	0
Multiple	15	15.62	11	21.57	1	9.09	0	0	0	0
Unclear/Unspecified	14	14.58	7	13.73	0	0	3	30	2	50

Note. Each column represents one of the five CPP genres, with cells displaying counts and percentages of occurrences across academic levels. Bolded values indicate the mode within each genre.

^a $N = 96$. ^b $N = 51$. ^c $N = 11$. ^d $N = 10$. ^e $N = 4$.



Intergroup Comparison of Pedagogical Orientations of CPPs

Pedagogical orientation	Analogy ^a		Metaphor ^b		Comparative judgement ^c		Variation theory ^d		Venn diagram ^e	
	No.	%	No.	%	No.	%	No.	%	No.	%
Cognition	83	86.46	32	62.75	2	18.18	9	90	4	100
Metacognition	3	3.12	8	15.69	1	9.09	0	0	0	0
Both	10	10.42	11	21.57	8	72.73	1	10	0	0

Note. Each column represents one of the five CPP genres, with cells displaying counts and percentages of occurrences across pedagogical orientations. Bolded values indicate the mode within each genre.

^a $N = 96$. ^b $N = 51$. ^c $N = 11$. ^d $N = 10$. ^e $N = 4$.

Intergroup Comparison of CPP Educational Objectives



Educational objective	Analogy ^a		Metaphor ^b		Comparative judgement ^c		Variation theory ^d		Venn diagram ^e	
	No.	%	No.	%	No.	%	No.	%	No.	%
Knowledge	73	76.04	30	58.82	0	0	3	30	3	75
Skill	9	9.38	10	19.61	8	72.73	4	40	1	25
Both	14	14.58	7	13.73	3	27.27	3	30	0	0
Personal development	0	0	4	7.84	0	0	0	0	0	0

Note. Each column represents one of the five CPP genres, with cells displaying counts and percentages of occurrences across educational objectives. Counts for knowledge and skill do not include occurrences with both objectives targeted. Bolded values indicate the mode within each genre.

^a $N = 96$. ^b $N = 51$. ^c $N = 11$. ^d $N = 10$. ^e $N = 4$.

Intergroup Comparison of CPP Comparators' Format



Formats	Analogy			Metaphor			Comparative judgement			Variation theory			Venn diagram		
	No. ^a	% ^a	% of "analogy" activities ^b	No. ^c	% ^c	% of "metaphor" activities ^d	No. ^e	% ^e	% of "comparative judgement" activities ^f	No. ^g	% ^g	% of "variation theory" activities ^h	No. ⁱ	% ⁱ	% of "Venn Diagram" activities ^j
Visual representation	34	20.73	35.42	21	24.71	41.18	4	36.36	36.36	5	26.32	50	4	50	100
Written text	38	23.17	39.58	24	28.24	47.06	5	45.45	45.45	2	10.53	20	3	37.5	75
Oral presentation	36	21.95	37.5	19	22.35	37.25	0	0	0	3	15.79	30	1	12.5	25
Mathematical language	16	9.76	16.67	1	1.18	1.96	0	0	0	3	15.79	30	0	0	0
Live experiment	13	7.93	13.54	1	1.18	1.96	0	0	0	2	10.53	20	0	0	0
Video	6	3.66	6.25	7	8.24	13.72	2	18.18	18.18	0	0	0	0	0	0
3D object	6	3.66	6.25	4	4.71	0.8	0	0	0	2	10.53	20	0	0	0
Photograph	3	1.83	3.13	6	7.06	11.76	0	0	0	2	10.53	20	0	0	0
Other/Unclear	8	4.88	8.33	2	2.35	3.92	0	0	0	0	0	0	0	0	0
Haptic element	2	1.22	2.08	0	0	0	0	0	0	0	0	0	0	0	0
Roleplay	2	1.22	2.08	0	0	0	0	0	0	1	0	0	0	0	0

Note. Each column represents one of the five CPP genres, with cells displaying counts, percentages of occurrence, and percentages of CPPs across comparators' formats. CPPs included 1–5 different formats for comparators. Bolded values indicate the mode within each genre.

^a*N* = 164. ^b*N* = 96. ^c*N* = 85. ^d*N* = 51. ^e*N* = 11. ^f*N* = 11. ^g*N* = 10. ^h*N* = 10. ⁱ*N* = 8. ^j*N* = 4.

Intergroup Comparison of CPP Comparators' Statuses



Statuses	Analogy			Metaphor			Comparative judgement			Variation theory			Venn diagram		
	No. ^a	% ^a	% of "analogy" activities ^b	No. ^c	% ^c	% of "metaphor" activities ^d	No. ^e	% ^e	% of "comparative judgement" activities ^f	No. ^g	% ^g	% of "variation theory" activities ^h	No. ⁱ	% ⁱ	% of "Venn Diagram" activities ^j
Concept(s)/Abstract idea(s)	80	44.69	83.33	41	41.84	80.39	0	0	0	4	33.33	40	3	60	75
Everyday life situation(s)/object(s)	68	37.99	70.83	45	45.92	88.24	0	0	0	0	0	0	1	20	25
Experimental result(s)	14	7.82	14.58	1	1.02	1.96	0	0	0	2	16.67	20	0	0	0
Peer production(s)	2	1.12	2.08	1	1.02	1.96	11	100	100	2	16.67	20	0	0	0
Case(s)	7	3.91	7.3	3	3.06	5.88	0	0	0	4	33.33	40	1	20	35
Personal experience(s)	3	1.68	3.13	4	4.08	7.84	0	0	0	0	0	0	0	0	0
Other	4	2.23	4.17	3	3.06	5.88	0	0	0	0	0	0	0	0	0
Natural phenomenon/a	1	0.56	1.04	0	0	0	0	0	0	0	0	0	0	0	0

Note. Each column represents one of the five CPP genres, with cells displaying counts, percentages of occurrence, and percentages of CPPs across comparators' statuses. CPPs included 1–3 different formats for comparators. Bolded values indicate the mode within each genre.

Conclusions



- ▶ CJ for learning: a developing field
- ▶ CJ as a more unified/rigid set of practices
 - peer productions
 - < skills
 - < metacognition
- ▶ Room for innovation