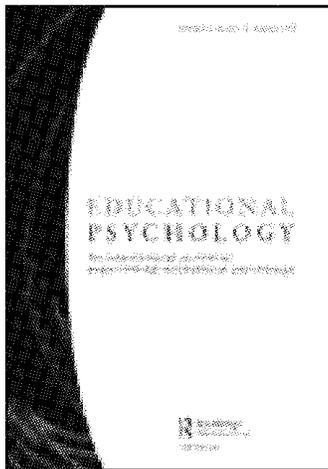


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Writing Approaches of Graduate Students

Ellen Lavelle* and Kathy Bushrow

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The writing approach framework provides a comprehensive perspective on college-level academic writing based on the relationship of writers' beliefs and strategies to the quality of written outcomes. However, despite increased demands for more and better writing at the graduate level, little is known about graduate-level writing processes or about the beliefs of graduate students regarding writing. The goals of this project were the preliminary development of a factor analytic model of graduate writing processes, and of an inventory to measure writing strategies. The results support seven independent factors: elaborative, low self-efficacy, no revision, intuitive, scientist, task-oriented, and sculptor, with the intuitive factor predictive of an academic writing outcome. Suggestions are advanced for classroom instruction and for further research.

Academic writing at the graduate level is a complex and often novel undertaking for the student. Indeed, expectations as regards breadth and depth, and the diverse range of writing demands (article critiques, academic papers, grant writing), call for new insights and increased levels of skill.

As early as the 1970s, Leming (1977) called for instructional support to prepare graduate students for the rigours of professional survival, and Struck (1976) reported on a course specifically designed to support graduate writing skills. Since then, numerous studies have addressed writing at the undergraduate level (e.g., Hayes & Flower, 1980; Nightingale, 1988; Reed, 1985; Wallace & Hayes, 1991), but the nature of the writing processes at the graduate level has been largely ignored by researchers.

The purpose of this study is to develop a psychometric model of graduate writing processes, and a reliable inventory to assess those processes. A new model of graduate writing processes would serve to explain development in writing at that level, and

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would provide instructional directions. A graduate writing process inventory would help students to understand themselves better as writers in terms of their motives and strategies, and raise awareness of writing options.

The Writing Approach Framework

Writers at all levels rely on strategies, or patterns of writing tactics, to achieve their writing goals. Common strategies include combinations of activities such as outlining, drafting, or free writing. Strategies vary between novice and expert writers (Benton, Kraft, Glover, & Plake, 1984), between native tongue and second language (L2) writers, between writers of similar competence levels such as college students (Biggs, Lai, Tang, & Lavelle, 1999), and between graduate students (Torrance, Thomas, & Robinson, 1994).

The construct of writing *approaches* has been used to describe the relationship between the beliefs that writers have about writing and the patterns of writing strategies that they employ. Writing approaches have been identified among undergraduate writers and consistently related to writing outcomes in a dynamic model: beliefs → strategies → outcomes (Lavelle & Guarino, 2003). Thus, the notion of approach represents a comprehensive perspective based on the relationship of beliefs about writing to the strategies that writers use, which, in turn, affect the quality of writing outcomes.

The idea of writing *styles*, on the other hand, addresses patterns of individual differences in strategy use, but assumes that those patterns are fairly consistent and largely not modifiable by instruction (cf. DiTiberio & Jensen, 1995). Thus writing approaches represent a more flexible, or fluid, dimension based on the interaction between the writer and the academic or writing environment. When writing environments are aligned to include meaningful, integrated tasks and assessments, writers are likely to take a meaningful approach. When writing environments are marked by disparate tasks or superficial assessments and fuzzy objectives, writers may be cued to adopt a more superficial or repetitive/reorganisational strategy in writing.

The basic differentiation in the approaches that writers take (similar to that used to define variation in college learning processes; see Biggs, 1987a; Entwistle & Ramsden, 1983) has been between a deep writing approach, based on taking a proactive position geared toward making a new meaning and using strategies such as complex revision, and a surface writing approach, which is primarily reproductive and involves a listing strategy and a linear outcome or an “ordered” presentation of facts (Biggs, 1988; Biggs et al., 1999; Hounsell, 1997; Lavelle, 1993, 1997). Discussing children’s writing, Bereiter and Scardamalia (1987) used the term “bed-to-bed writing” to describe the surface position: “First I got up, then I went out, then I had lunch...” Unfortunately, this type of linear production often persists even at the graduate level! Too often, students consider listing the “five major points” as sufficient. But academic writing is a constructive process of integrating and structuring information to make a meaning that is beyond the sum of the words, and listing the five major points in standard English is not indicative of the construction of a complex meaning. If five

major points are the instructor's expectation, the instructor might do well to consider an objective test instead. Appendix A represents the core characteristics of deep and surface writing, as based on a range of writing research (cf. Entwistle & Entwistle, 1991; Hounsell, 1997; Lavelle, 1993; Lavelle & Guarino, 2003; Lavelle & Zuercher, 2001).

Examining the writing processes of college students, Lavelle (1993) used a psychometric method to identify a five-factor structure thought to be reflective of the basic deep and surface continuum and measured by the Inventory of Processes in College Composition. The first factor, "elaborative", is marked by a search for personal meaning, by self-investment, and by viewing writing as symbolic, representing a deep, personal orientation. The second factor, "low self-efficacy", describes a writing approach based on doubt, and on thinking about writing as a painful task ("Writing is always a slow process"). "Reflective-revision", the third factor, describes a deep writing approach based on a sophisticated understanding of the revision process as a remaking or rebuilding of one's thinking. The fourth factor, "spontaneous-impulsive", profiles an impulsive and nonplanning approach similar to Biggs' surface restrictive style (cf. Biggs, 1988). The "procedural" approach is a method-oriented approach based on adherence to rules and a minimal amount of involvement.

Validity studies have supported the scales as predictive of college student learning styles, composition grades (Lavelle, 1993), narrative writing performance, complexity of essay outcome, writing apprehension (Lavelle & Zuercher, 1997), and writing skills at the graduate level (Biggs et al., 1999). In particular, reflective-revision scale scores were predictive of grade in freshman composition (Lavelle, 1993) and elaborative scale scores were predictive of the quality of narrative writing (Lavelle, 1997). In a confirmatory factor analysis, the original structure was confirmed and second-order deep and surface variables were identified. Here, the hypotheses that elaborative and reflective-revision variables were linked to a deep process involving metacognition, focus at the global level, and proactive engagement in writing, and that the low self-efficacy, spontaneous-impulsive, and procedural factors were linked to a more superficial, linear, and passive process, were supported.

Graduate Writing

Given the increased writing demands of courses at the graduate level, including greater emphasis on depth and breadth, demand for genre competence, and often expectation for publication, merely reporting or "summarising" are insufficient. Graduate writers must often integrate disparate ideas, synthesise perspectives, and extend theory—which demands higher-level construction skills and perspective-taking, as well as greater concern for accuracy, voice, and audience. In addition, the range of writing tasks may now vary to a greater degree as students are faced with writing opinion papers, article critiques, journal articles, theses, and research grant applications (cf. Woodford, 1999). Finally, writing outcomes often account for a much greater proportion of evaluation criteria than in the undergraduate years.

Given the higher expectations as regards quality and breadth, and evaluation standards, it is surprising that few research studies have addressed this issue.

Notable exceptions include Baxter Magolda (1998), who conducted a longitudinal study to explore the emergence of self-authorship in graduate writing, and Hernandez (1985), who explored specific problems in graduate-level research writing. Gupta (1995) addressed graduate writing using case studies focused on written introductions to research articles, and Hildebrand (1984) addressed writing in pre-professional graduate education. Others have considered graduate writing from the faculty vantage point (Casanave & Hubbard, 1992), and in terms of the availability of specific supportive coursework at that level (Golding & Mascaró, 1987).

From a cognitive process perspective, Torrance et al. (1994) differentiated the writing strategies of social science graduate students using a self-report questionnaire. Cluster analysis was used to identify three distinct groups of students: planners, who planned extensively and then made few revisions; revisers, who developed content and structure through extensive revision; and mixed strategy writers, who both planned before starting to write and revised extensively as part of their writing process. Interestingly, planners reported higher productivity than both revisers and mixed strategy writers, and planners and revisers did not differ in how difficult they found writing to be, although planners found writing to be less difficult than mixed strategy writers.

Similarly, Biggs et al. (1999) conducted an experimental study to find changes in writing approaches, as measured by the Inventory of Processes in College Composition, following a workshop intervention for graduate students writing dissertations in English as a second language in China. After a two-day workshop, students showed a significant increase in elaboration, decreases in procedural and spontaneous-impulsive approaches, and they reported that they liked the writing model because it helped them think about their writing and how they might improve their future approach to writing. They also reported that they valued didactic advice about structuring their dissertations, writing abstracts, reading for meaning, taking notes, and summarising. Similarly, Torrance et al. (1994) found that students preferred “product-oriented” instruction. While the Inventory of Processes in College Composition proved useful in addressing graduate writing needs in an instructional setting, it is important to fully validate the inventory for use with a graduate population.

In line with psychometric investigations of the writing strategies of college students (Lavelle, 1993; Lavelle & Guarino, 2003), and in consideration of the research conducted with graduate students (Torrance et al., 1994), the goal of this study is to develop a writing process model based on graduate student beliefs and strategies. An Inventory of Processes in Graduate Writing (IPGW) is developed to elucidate the graduate-level writing process by linking students’ beliefs about writing to the strategies that they use at that level. The goal is to provide for more individualised and effective support for students engaged in writing as a critical learning and evaluative process.

Factor analysis has been supported as both a data reduction and a model building procedure, and has commonly been used to develop inventories of student writing

strategies (Lavelle, 1993; Lavelle & Guarino, 2003) and learning strategies (Biggs, 1987). In addition, the factor analytic method would allow for investigation of second-order deep and surface structure, as it has proved a useful tool for investigation of deep and surface learning styles (cf. Kember & Leung, 1998).

In order to develop the model, a two-phase study was conducted. The first phase involved identifying those factors most representative of the writing strategies and beliefs of graduate students using a psychometric procedure. The relationship of those factors to hypothesised second-order deep and surface factors was then explored. The second phase assessed the predictive relationship between the scales (factors) and writing outcome, gender, age, and level of teaching variables.

Phase 1: Development

Method

Participants. Participants were 421 graduate students enrolled in foundational courses required as part of the master's degree in education at a large Midwestern university. The sample was predominantly female (309 females and 109 males), with 182 students (43%) reporting that they were aged 20–30, 121 (29%) 31–40, 62 (15%) 41–50, while 43 (10%) indicated that they were over 50 years of age. Three participants did not report gender and 13 did not report age.

Instrumentation and procedure. A total of 76 forced-choice items were included in the survey, based on the Inventory of Processes in College Composition and on Torrance et al.'s (1994) questionnaire. The Inventory of Processes in College Composition comprises five subsets of items—elaborative, low self-efficacy, reflective revision, spontaneous-impulsive, and procedural—reflecting students' approaches to writing as linked to beliefs about academic writing and strategies. An additional 11 questions were added from the Torrance survey (Torrance et al., 1994) that were thought to extend the original inventory by specifically addressing graduate writing.

The modified inventory, called the Inventory of Graduate Writing Processes, was administered to participants during regular class periods. After the researcher read the directions, students completed the multiple choice instrument by responding on scantron sheets to a four-point Likert scale. Participation was voluntary and data collection was anonymous. General completion time was 13 minutes.

Results

The purpose of the first analysis was to determine the factor structure of graduate writing processes, and to compare that with the structure reflected by the original Inventory of Processes in College Composition. In line with previous psychometric studies involving writing approaches (Lavelle, 1993; Lavelle & Guarino, 2003), the initial data reduction step involved a principle components analysis and a scree test (cf. Cattell, 1966) to determine the number of factors. The correlation matrix was

then factor analysed using a principal factor method and rotated to the varimax orthogonal criteria in line with previous studies on writing (Lavelle, 1993; Lavelle & Gaurino, 2003). Only items meeting the .30 criteria were retained.

Based on a scree test (Catell, 1966) and on the interpretability criteria (Shur, 2006), seven factors, comprising 67 items, were retained which accounted for 36% of the variance. The factors were labelled elaborative, low self-efficacy, no revision, intuitive, scientist, task-oriented, and sculptor. Table 1 presents the seven factors with item loadings. Internal consistencies (Cronbach's alpha) ranged from .82 to .42, and were considered acceptable and in line with similar investigations involving the measurement of learning approaches (Biggs, 1987) and attitudes (Behrens, 1997; O'Brien, Heppner, Flores, & Bikos, 1997). Fishman and Galguera (2003) have argued that interpretation of reliability is dependent on test purposes, and that for tests that are primarily research tools rather than decision-making tools, reliabilities may be less critical. Interscale correlations were low to moderate (Table 2).

Table 1. Final items and loadings

Factor 1: Elaborative	
45. At times my academic writing has given me deep personal satisfaction	63
4. Writing academic papers makes me feel good	61
46. The main reason for writing an academic paper is just to get a good grade on it	-60
30. Writing assignments in graduate courses are always learning experiences	58
61. Writing an academic paper helps me develop my ideas	57
62. Academic writing is cold and impersonal	-57
50. Writing an academic paper is like a journey	54
44. Academic writing helps me organise information in my mind	54
58. My intention in writing is just to answer the question	-53
21. Academic papers usually have little to do with what I do in my career or my life	-49
40. Writing an academic paper is making a new meaning	49
15. I worry about how much time my paper will take	-34
Factor 2: Low self-efficacy	
53. I worry so much about my writing that it prevents me from getting started	64
63. I need special encouragement to do my best academic writing	63
13. I can write a term paper without any help or instruction	-60
56. I do well on tests requiring essay answers	-56
32. Having my writing evaluated scares me	56
64. I can't revise my writing because I cannot see my own mistakes	53
35. I like to work in small groups to discuss ideas or to do revision in writing	47
49. I expect good grades on academic papers	-45
27. I am familiar with the components of a research paper or thesis	-44
18. Writing an essay or paper is always a slow process	41
23. Studying grammar and punctuation would greatly improve my writing	35
Factor 3: No revision	
60. Often my first draft is my finished product	74
66. I do not normally expect to make significant changes to my text by revising it	71
41. My revision strategy is usually making minor alterations, just touching things up	70

Table 1. (continued)

16. I tend to write a rough draft and then go back repeatedly to revise it	-68
7. Revision is a onetime process at the end	67
3. I reexamine and restate my thoughts in revision	-52
17. Revision is the process of finding the shape of my writing	-46
51. I plan, write and revise all at the same time	42
29. I never think about how I go about writing	34
Factor 4: Intuitive	
25. I can hear myself while writing	62
57. I often think about my paper when I am not writing (late at night)	58
24. I visualise what I am writing about	58
33. I tend to spend a long time thinking about my writing assignment before beginning	54
6. I can hear my voice as I reread papers that I have written	54
36. I imagine the reaction that my readers might have to my paper	49
5. I closely examine what the essay calls for	42
31. In my writing I tend to use some ideas to support other, larger ideas	42
22. It is important to me to like what I have written	39
28. I put a lot of myself in academic writing	39
26. My prewriting notes are always a mess	36
34. When writing a paper, I often get ideas for other papers	33
Factor 5: Scientist	
9. When faced with an academic paper, I develop a plan and stick to it	60
67. It is important to me to have my ideas or arguments clear before writing	51
1. When writing an academic paper, I stick to the rules	47
10. I keep my topic clearly in mind as I write	46
43. The thesis or main idea is the heart of the academic paper	43
2. I set aside specific times to do academic papers	38
55. I start with a fairly detailed outline	37
54. I like written assignments to be well specified with details included	35
12. The thesis or main idea dictates the type of paper to be written	31
Factor 6: Task-oriented	
65. When writing an academic paper, my idea or topic often changes as I progress	51
39. My writing rarely expresses what I really think	44
37. I complete each sentence and revise it before going on to the next	42
8. There is usually one best way to write an academic paper	40
38. I cue my reader by giving a hint of what is to come	40
48. My essay or paper often goes beyond the specifications of the assignment	37
47. When given an assignment, I immediately know which side I will take	33
42. I am my own audience	33
Factor 7: Sculptor	
59. I just write off the top of my head and then go back and rework the whole thing	48
11. When writing an academic paper, I tend to write what I would say if I were talking	45
52. I usually write several paragraphs before rereading	42
20. Writing academic papers reminds me of other things that I do	41
19. Academic writing is symbolic	40
14. Originality in writing is highly important in academic writing	35

Table 2. Reliabilities, means, standard deviations, and correlations for the IPGW

Scale	α	M	SD	E	LS	NR	I	SP	TO	S
E	.82	30.25	5.61							
LS	.63	25.72	4.30	-.24**						
NR	.80	19.78	4.78	-.26**	-.01					
I	.77	35.11	4.73	.44**	.07	-.32**				
SC	.43	27.62	2.62	.14**	.00	-.14**	.34**			
TO	.56	17.99	2.97	.13**	.13**	.22**	.26**	.10*		
SR	.42	15.24	2.32	.18**	.10*	.04	.25**	.09	.19**	

* $p > .05$; ** $p > .01$.

Interpretation

The first factor, elaborative, describes rich personal investment in writing, acknowledges writing as a tool for learning, and describes an affective orientation (“Writing makes me feel good”). Given the themes of proactive engagement and meaning in writing that mark this factor, it seems that elaborative might be linked to a deep writing approach. The second factor, low self-efficacy, describes a “needy” predisposition toward writing with little confidence in skill or attributions for success. The third factor, no revision, describes a resistance toward revision, both as a concept (“Revision is not the process of finding the shape of my writing”) and as a process (“I do not normally expect to make significant changes to my text by revising it”). Factor four, intuitive, describes an imaginal orientation whereby writers seem to visualise the scheme (“I visualise what I am writing about”) or hear the pace of writing (“I can hear myself while writing”). Scientist, factor five, describes reliance on a well-formulated plan for writing, with arguments being clear before writing (similar to Torrance’s planners; see Torrance et al., 1994). Task-oriented describes a writing approach based on adherence to the rules with little opportunity for self-expression, while factor seven, sculptor, describes a propensity to get it all out in a rough draft, and then to go back and refine (“I just write off the top of my head and then go back and rework the whole thing”).

Second-Order Analysis and Results

Based on the criteria for deep and surface writing (Appendix A), elaborative, intuitive, and scientist were identified as deep factors. Here meaning, depth of process, elaboration, and understanding of writing as tool for meaning-making were paramount. The other factors—low self-efficacy, no revision, and task-oriented—were defined as surface factors linked to a superficial understanding of the writing/revision processes and simplistic or less meaningful strategies (“I complete each sentence and revise it before going on to the next”). Sculptor was also hypothesised to be a deep factor in line with previous interpretation (Torrance et al., 1994). Research on

famous writers supports a “get it all down in a rough draft” strategy, and we felt that this factor described this orientation.

A second-order factor analysis was employed to confirm the hypothesis that two latent deep and surface factors could be defined using scale scores as indices. Deep and surface second-order factors have previously been identified in college writing (Lavelle & Guarino, 2003) and in college learning (Kember & Leung, 1998). Elaborative, intuitive, scientist, and sculptor were hypothesised to load on a deep second-order factor, while low self-efficacy, no revision, and task-orientated were hypothesised to be linked to a surface factor. In order to test these hypotheses, scale scores were used as variables and the correlation matrix was rotated to the varimax criteria. Table 3 reflects the two second-order factors with scale loadings. The factors, termed deep and surface, accounted for 48% of the variance.

Phase 2: Validity

Method

Subjects. Participants were 58 graduates studying advanced educational psychology, a foundational course required of all master’s-level degree students in the school of education at a large Midwestern university.

Procedure. Participants completed the Inventory of Graduate Writing Processes during regular class periods by responding on scantron sheets to each of the 67 items plus three demographic items which addressed gender and years of teaching. The mean completion time for the inventory was 12 minutes.

Participants also completed an academic research paper on a self-chosen topic related to teaching and learning in the classroom. Students were provided with the objectives of the assignment and with a brief review of the components and functions of the library research paper. Papers were written over the course of the semester, without instructor feedback (topics had been approved by the instructor in advance of student writing).

In order to assess these papers, two raters were trained to use the holistic rubric (Creehan, 2005). The training sessions involved demonstration of the rubric, review

Table 3. Deep and surface factors

Scale	Deep factor	Surface factor
Intuitive	.790	.301
Elaborative	.763	-.095
No revision	-.573	.444
Scientist	.511	.148
Task-oriented	.198	.754
Sculptor	.287	.553
Low self-efficacy	-.167	.503

of sample papers, and opportunities for practice. Inter-rater reliability was established and considered acceptable ($r = .87$)

Results

In order to test for a predictive relationship between scale scores and writing outcomes, a stepwise regression was conducted. Only one variable, intuitive, was found to be predictive of the quality of writing ($\beta = .271, p < .001$), with 8% of the variance accounted for. Other variables—elaborative, low self-efficacy, no revision, scientist, and task-oriented—were excluded from the equation. Analyses of variance revealed no significant differences based on gender or level of teaching across scale scores.

Discussion and Implications

This study advances a process interpretation of graduate-level writing by identifying seven factors based on the writing-related beliefs and strategies of graduate students. Given that little is known about what graduate students think about writing or about what they do when faced with academic writing tasks, it is important to consider the components of graduate writing processes in order to provide effective support and, more generally, to understand developmental differences.

Perhaps the most interesting finding is the emergence of a new strategy, intuitive, which was found to be predictive of the quality of an academic writing outcome. Intuitive describes a somewhat sensual relationship to writing and is not found in the undergraduate population (Lavelle, 1993; Lavelle & Guarino, 2003). Intuitive seems to suggest that some writers are in touch with the pace and flow of writing on “another” level, or beyond the cognitive plane (“I can hear myself while writing,” or “I visualise what I write about”). Intuitives seem to hear, or envision, writing. It may be that their sensory connection rests on exposure to research articles at the graduate level, which provides familiarity with the rhythm, pace, or flow of academic writing. It is interesting to note that intuitive is the primary index of a deep approach to writing, as per the second-order analysis. The major implication of this factor for instruction might include familiarising students with genre by providing models and examples.

The elaborative factor, which emphasises writing as a personal tool for self-expression, is common to both models, although not linked to academic writing performance for graduate students. It may be that elaboration is not a useful strategy for negotiating traditional academic writing, or that the academic essay form is biased against personal self-expression. Elaboration was supported as an index of the deep approach in the second-order analysis ($r = .763$), and similar results have been found in the undergraduate population (Lavelle & Guarino, 2003). Here, instruction might be geared to encourage those reliant on an elaborative approach to become more familiar with academic genre and with the role of voice and audience in academic writing.

Low self-efficacy, the second factor, describes writing as a fearful venture based on doubt regarding writing ability, for both graduates and undergraduates. Graduate students scoring high on this factor seem to suffer from writer's block as they are submerged in worry and doubt—affective characteristics related to surface writing. Suggestions for instruction include providing graduate students with clearly defined writing tasks, taking time to review and offer meaningful suggestions for revision, and encouraging those students who are writing theses to choose personally meaningful topics, engage in peer review, and to set goals and timelines. Too often, teachers assume that academic genre is familiar or are not clear about expectations, and students' final papers can be turned in on the last night of class without having been reviewed by instructors. Struck's (1976) idea of providing a graduate writing course may be valid, or at least including writing instruction within the content domain at the graduate level. Along the same lines, providing for supportive groups or peer review opportunities and providing prompt and meaningful feedback may foster writing efficacy in students.

No revision describes a “one time wonder” approach, and it may be that many graduate students feel too busy to revise fully (“Often my first draft is my finished product,” or “I do not expect to make significant changes to my text by revising it”). Most graduate students in our sample were in their 30s, teaching or working full-time, often also raising children, and focused on dealing with the complexities of young-mid adult life in an increasingly complex society. While this does not excuse a lack of respect for the revision process as an integral component of writing, it is important to note that revision takes time, and skills such as multitasking do not foster meaning. Since graduate students often do not have the writing habit as an ongoing and evolving enterprise, professors might encourage planning, teach revision, and stress relevance. It is interesting to note that no revision loaded on both the deep approach ($r = -.57$; note the negative relationship) and the surface approach ($r = .44$; suggestive of a moderate positive relationship).

Scientist describes taking an organised, structural approach to writing. It is as though scientists set out to construct their writing based on a well-defined schematic. Indeed, graduate students often have to manage and organise a wealth of information, and it is understandable that they might tend to rely on a tight agenda—but flexibility is important too as academic writers weave, reflect, and create meanings. While working from a plan may be effective for some (Torrance et al., 1994), clearly academic writing involves more than a tightly honed, logical structure. This is not to say that there is no merit in this strategy—rather, that while a scientific approach may help with organisation, over-reliance on this approach may limit creativity.

Task-oriented describes an approach geared to “just getting it over with”. Task-oriented is based on linear assumptions about writing (“There is one best way to write a paper,” or “I complete each sentence and revise it before going on to the next”). Perhaps interventions for students scoring high on this factor might include activities designed to expand their awareness of writing as tool for self-expression and meaning-making. These activities might also help them to find permission to get away from the rules via free writing or journaling. It is as though exclusive attention

to rules and regulations combined with a micro focus on “correct writing” may deter making a complex meaning. It is unfortunate that this approach is a strong component in graduate writing, although it may be that instruction is the culprit. Too often, writing instruction focuses on disparate or reductionistic tasks and competitive or normed evaluations which do violence to the nature of writing as a tool of meaning (Lavelle & Guarino, 2003). Task-oriented was the strongest index of a surface approach to writing in the second-order analysis ($r = .75$)

Sculptor represents a perhaps sloppy, “big picture” approach (“I just write off the top of my head and then go back and rework the whole thing”). Sculptors see writing as symbolic, or perhaps as a system. Their apparent comfort with writing allows them the freedom to get it all out, before it slips away, but what the next step is remains unclear. Sculptor loaded on the surface factor—perhaps because while rough drafting may be ideal, it must be followed by extensive revision, and that strategy does not appear as part of the sculptor approach. Suggestions for support include emphasising revision.

Our study provides a first step toward a comprehensive process framework for understanding graduate writing. Suggestions for future research include conducting studies to validate fully and perhaps extend the model. These might include confirmatory factor analyses with new samples, and predictive studies geared to test for relationships between scale scores and various types of writing outcomes or disciplinary genre. Experimental studies might test the effects of interventions based on the model (cf. Biggs et al., 1999). It is also important to extend validity using multiple methods such as case studies, interviews, or writing protocols. Our study was limited to master’s degree students; future studies might address the needs of doctoral students in pre-professional programs.

The complexity of writing at the graduate level demands that students move beyond the strategies of their undergraduate years, and that graduate instructors develop awareness of what graduate students believe about writing and about how it is that they tackle writing assignments at that level. Meaningful support and instruction are key, especially since graduate writers come from diverse instructional backgrounds and maintain a full array of motives and beliefs. In particular, support should include providing students with models, encouraging genre familiarity, and talking about writing, writers’ beliefs, and how it is that academic writing functions at that level as both a tool of learning and one of communication. While creative problem-solving, insightful application, and synthesis of theory are common to graduate education, how it is that students negotiate academic understandings and express and structure their ideas is largely framed, or even driven, by the quality of writing. The Inventory of Processes in Graduate Composition and the related factorial model begin to shed light on these critical processes.

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Appendix A: Deep and Surface Writing Characteristics

Deep writing:	Surface writing:
Reflective	Reproductive
High or alternating level of focus	Focus at the local level
Hierarchical organisation	Linear, sequential structure
Engaged	Detached
Audience concern	Less audience concern
Thinks about essay as an integrated whole	Sees essay as an organised display
Thesis-driven	Data-driven
Revision	Editing
Coherence	Cohesion
Transforming, going beyond assignment	Telling within the given context
Autonomous	Rule-bound
Feelings of satisfaction, coherence, connectedness	

Appendix B: Inventory of Processes in Graduate Writing**QUESTIONNAIRE: HOW GRADUATE STUDENTS WRITE ACADEMIC PAPERS**

This questionnaire describes different ways that graduate students go about writing **academic papers (e.g. research papers, critiques, reviews and theses)**. There are no right or wrong answers because there are many different ways that work for different students. Just think about what you **usually** do and respond quickly. The goal is to better understand how graduate students feel about writing and how they complete writing tasks so that instructors can design their courses with students' skills and needs in mind. There is very little known about graduate level writing, so your participation will be very helpful.

Answer **Strongly Agree, Agree, Disagree, Strongly Disagree** to each statement. Indicate your answers on the answer sheet provided using a # 2 pencil.

- A. Strongly Agree**
- B. Agree**
- C. Disagree**
- D. Strongly Disagree**

1. When writing an academic paper, I stick to the rules.
2. I set aside specific times to do academic papers.
3. I reexamine and restate my thoughts in the revision process.
4. Writing academic papers makes me feel good.
5. I closely examine the writing assignment before beginning.
6. I can hear my voice as I reread papers that I have written.
7. Revision is a onetime process at the end.
8. There is usually one best way to write an academic paper.
9. When faced with an academic paper, I develop a plan and stick to it.
10. I keep my topic clearly in mind as I write.
11. When writing an academic paper, I tend to write what I would say if I were talking.
12. The thesis or main idea dictates the type of paper to be written.
13. I can write a term paper without any help or instruction.
14. Originality in writing is highly important in academic writing.
15. I worry about how much time my paper will take.
16. I tend to write a rough draft and then go back repeatedly to revise.
17. Revision is the process of finding the shape of my writing.
18. Writing an essay or paper is always a slow process.
19. Academic writing is symbolic.
20. Writing academic papers reminds me of other things that I do.
21. Academic papers usually have little to do with what I do in my career or my life.
22. It is important to me to like what I have written.
23. Studying grammar and punctuation would greatly improve my writing.
24. I visualise what I am writing about.

25. I can hear myself while writing.
26. My prewriting notes are always a mess.
27. I am familiar with the components of a research paper or thesis.
28. I put a lot of myself in my academic writing.
29. I never think about how I go about writing.
30. Writing assignments in graduate courses are always learning experiences.
31. In my writing I tend to use some ideas to support other, larger ideas.
32. Having my writing evaluated scares me.
33. I tend to spend a long time thinking about my writing assignment before beginning.
34. When writing a paper, I often get ideas for other papers.
35. I like to work in small groups to discuss ideas or to do revision in writing.
36. I imagine the reaction that my readers might have to my paper.
37. I complete each sentence and revise it before going on to the next.
38. I cue my reader by giving a hint of what is to come.
39. My writing rarely expresses what I really think.
40. Writing an academic paper is making a new meaning.
41. My revision strategy is usually making minor changes, just touching things up.
42. I am my own audience.
43. The thesis or main idea is the heart of the academic paper.
44. Academic writing helps me organise information in my mind.
45. At times my academic writing has given me deep personal satisfaction.
46. The main reason for writing an academic paper is just to get a good grade on it.
47. When given an assignment calling for an argument or viewpoint, I immediately know which side I will take.
48. My essay or paper often goes beyond the specifications of the assignment.
49. I expect good grades on academic papers.
50. Writing an academic paper is like a journey.
51. I plan, write and revise all at the same time.
52. I usually write several paragraphs before rereading.
53. I worry so much about my writing that it prevents me from getting started.
54. I like written assignments to be well-specified with details included.
55. I start with a fairly detailed outline.
56. I do well on tests requiring essay answers.
57. I often think about my paper when I am not writing (e.g. late at night).
58. My intention in writing is just to answer the question.
59. I just write off the top of my head and then go back and rework the whole thing.
60. Often my first draft is my finished product.
61. Writing an academic paper helps me develop my ideas.
62. Academic writing is cold and impersonal.
63. I need special encouragement to do my best academic writing.
64. I can't revise my writing because I cannot see my own mistakes.
65. When writing an academic paper, my idea or topic often changes as I progress.
66. I do not normally expect to make significant changes to my text by revising it.
67. It is important to me to have my ideas or arguments clear before writing.