

University of California, Irvine

**2009 Assessment of
Upper Division Writing at UCI**

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Introduction

The purpose of this report is to present findings from the Summer 2009 Assessment of Upper-Division Writing at UCI. A random selection of papers from Biology 100LW, Experimental Biology Laboratory, Engineering 190W, Professional Communications in the Technical World and Writing 139, Advanced Expository Writing, were collected in Spring 2009 and assessed using a common scoring rubric to determine the quality of student writing achieved through completion of the upper-division writing requirement at UCI. Differences across courses as well as student characteristics were examined.

Key Findings

The analysis of upper-division student writing products found the quality of student writing to be lower than what had been expected. Students appear to be strongest in their writing skills related to the use of generic and disciplinary conventions and weakest in their ability to demonstrate critical thinking and analysis skills through their writing as well as their ability to effectively use evidence/research in their writing.

While no significant differences in writing quality were observed between upper-division courses, the assessment project confirmed the need for greater clarity on the goals of upper-division writing across disciplines, and the importance of providing students with writing assignments that allow them to both achieve and demonstrate the writing skills and abilities reflected by the rubric. While no significant differences in writing quality emerged as a function of students' language status, a significant difference in writing quality did surface as a function of students' enrollment status. Students who enrolled at UCI directly from high school demonstrated a higher quality of writing than their transfer student counterparts, with significant differences emerging in the use of evidence/research writing category. The Upper Division Writing Assessment Rubric was found to be a reliable and valid tool overall. Nonetheless, the findings from this project suggest the need for modifications to the development and structure and generic and disciplinary conventions categories to more accurately reflect and capture disciplinary writing expectations.

Overall, this project underlined the complexity associated with achieving clarity and agreement on the shared writing skills and techniques across disciplines, and the need for course writing assignments that provide students with the opportunity to practice, achieve, and demonstrate those shared writing skills and abilities, most notably critical thinking and analysis and the use of evidence and research.

Assessment Design

Based on the findings and results of the 2008 Pilot Assessment of Upper-Division Writing, the Campus Writing Coordinator sought to continue assessing student writing produced in upper-division courses, focusing on writing produced in Biological Sciences, Engineering, and Humanities. The 2009 Upper-Division Writing Assessment Project sought to further refine the Upper-Division Writing Assessment Rubric, collect information about the quality of student writing produced in upper-division writing courses, and determine whether such student characteristics as first language and transfer vs. high school status impact the quality of student writing. With these goals in mind, this assessment sought to answer the following questions:

- Writing Rubric: To what extent does the Upper-Division Writing Assessment Rubric capture the writing skills and techniques shared across academic disciplines? Is the rubric a reliable and valid instrument?

- Student Writing Skills: What is the quality of student writing produced in upper-division courses? Does the quality meet faculty expectations? Are there differences in the observed quality of student writing as a function of their upper-division writing course?
- Student Background and Writing: To what extent does the quality of student writing vary as a result of the student's language status and whether they transferred to UCI or came here directly from high school?

The Upper-Division Writing Assessment Rubric

In Spring 2008, through numerous discussions designed to determine the shared writing skills and techniques that exist across academic disciplines, six writing elements emerged as relevant to writing across disciplines; they are: (1) mechanics (grammar, punctuation, etc.), (2) source usage mechanics, (3) organization and structure, (4) audience, (5) familiarity with disciplinary discourse, and (6) critical thinking/analysis.

These six writing components were collapsed into the four writing categories contained within the Upper-Division Writing Assessment Rubric: critical thinking and analysis, use of evidence/research, development and structure, and generic and disciplinary conventions.¹ In response to the findings and recommendations from the 2008 Pilot Assessment of Upper-Division Writing, modifications were made to the rubric's quality labels and descriptions within the four writing categories in an effort to more accurately capture the shared writing expectations across disciplines. The four levels of quality, (0) insufficient evidence, (1) some evidence, (2) good, and (3) mastery, and their descriptions for each of the writing rubric's writing categories are presented in Table 1.

¹ The six writing elements that emerged as relevant to writing across disciplines (1) mechanics (grammar, punctuation, etc.), (2) source usage mechanics, (3) organization and structure, (4) audience, (5) familiarity with disciplinary discourse, and (6) critical thinking/analysis were collapsed into the four writing categories of the Upper-Division Writing Assessment Rubric as follows: Category 1: "Critical Thinking and Analysis" addresses writing elements #4, #5, and #6; Category 2: "Use of Evidence/Research" addresses writing elements #2, #4, and #5, Category 3: "Development and Structure" addresses writing elements #1 and #3, Category #4: "Generic and Disciplinary Conventions" addressed writing elements #1, #2, #3, and #4.

Table 1: Upper Division Writing Assessment Rubric

Category 1: Critical Thinking & Analysis	Category 2: Use of Evidence/Research
<p><u>3: Mastery:</u> The approach to the assigned topic of study is insightful, and/or creative, persuasive, unique, and worth developing; the level of thinking/analysis is sophisticated; the ideas are clearly communicated with focus and specificity; the topic is considered/discussed from several facets or perspectives; the writer understands discipline-specific methods for producing knowledge; the content seems expertly tailored to the disciplinary audience</p> <p><u>2: Good:</u> The approach is acceptable, reasonable, thoughtful; the level of thinking/analysis is appropriate; the ideas offered are usually specific and focused, some are insightful, usually communicated clearly; the writer shows an awareness of other facets or perspectives; the writer seems to understand the disciplinary discourse and has taken some care with including content that is appropriate to the disciplinary audience</p> <p><u>1: Some Evidence:</u> The approach is adequate (even if barely so); some evidence of thinking/analysis, or an attempt at analysis, is evident; some of the ideas offered are clearly delineated, thought-through, and appropriate to the task; the writer attempts to show awareness of at least one other facet or perspective; the writer seems aware of the disciplinary discourse and has included content that is relevant to the disciplinary audience</p> <p><u>0: Insufficient Evidence:</u> The approach is inadequate or indeterminable; very little evidence of critical thinking and analysis are evident; although some of the ideas may be worthwhile, the level of insight and clarity of presentation are lacking; the writer does not take into account other facets or perspectives, or does so in an inappropriate or simplistic manner; the thinking lacks focus and clarity, but may illustrate misconceptions; little or no evidence of awareness of disciplinary audience</p>	<p><u>3: Mastery:</u> Uses evidence/sources appropriately and effectively, with clear understanding of the disciplinary audience's expectations; considers (if appropriate) the previous knowledge generated within the discipline (e.g., literature review); evidence/sources used help develop and exemplify the overall argument/purpose of the writer; evidence/sources are clearly and correctly represented and smoothly integrated into writer's argument/purpose; correct and appropriate use of citation methods for the disciplinary genre</p> <p><u>2: Good:</u> Uses evidence/sources appropriately and sometimes effectively, with understanding of the disciplinary audience's expectations; shows awareness (if appropriate) of the previous knowledge generated within the discipline (e.g., literature review); evidence/sources used generally contribute to the overall argument/purpose of the writer; evidence/sources are usually represented with clarity and with no misreading; evidence/sources are smoothly integrated into writer's argument/purpose (writer controls the ideas, the sources do not); correct and appropriate use of citation methods for the disciplinary genre</p> <p><u>1: Some Evidence:</u> Some evidence/sources have been used appropriately, in a way that furthers the writer's purpose/argument; some evidence of disciplinary expectations for sources/research are evident; evidence/sources are presented with some degree of clarity, although some misreading or simplistic reading may be evident; the evidence/sources may overwhelm the writer's own voice and purpose; evidence/sources are usually integrated into the prose; some awareness of the disciplinary genre's expectations for citation and quotation are evident.</p> <p><u>0: Insufficient Evidence:</u> Evidence/sources, if present at all, are often used inappropriately, simplistically, or misreading is evident; the writing shows little or no evidence of the writer's understanding of the discipline's expectations for presenting evidence and using sources; evidence/sources are mis-matched with the writer's purpose within the prose; little or no awareness or presence of citation and documentation standards for the discipline</p>

Table 1: Upper Division Writing Assessment Rubric (continued)

Category 3: Development & Structure	Category 4: Generic & Disciplinary Conventions
<p><u>3: Mastery:</u> The prose exhibits a clear articulation of the genre/discipline’s methods of organizing written discourse; the organization is apparent, coherent, and contributes to the overall goals; the insightful, specific, focused development of the main purpose/thesis is effectively organized in paragraphs or sections (as appropriate to the genre/discipline); sophisticated transitional devices often develop one idea from the previous one or identify their logical relations; the reader is effortlessly guided through the chain of reasoning or progression of ideas</p> <p><u>2: Good:</u> The prose illustrates the writer’s understanding of the genre/discipline’s methods of organizing written discourse; the organization is usually apparent, coherent, and contributes to the overall goals; the development of ideas is sometimes insightful, usually specific and focused, following a logical progression; appropriate transitions connect the ideas and show relations between them; the reader is guided through the chain of reasoning or progression of ideas</p> <p><u>1: Some Evidence:</u> The prose sometimes illustrates the writer’s understanding of the genre/discipline’s methods of organizing written discourse; the organization is usually apparent, usually coherent, and in some cases, contributes to the overall goals; the development of ideas is sometimes insightful, specific, focused, and logical; some transitional devices are employed to connect the ideas; the reader can follow the chain of reasoning or progression of ideas</p> <p><u>0: Insufficient Evidence:</u> The prose does not clearly illustrate the writer’s understanding of the genre/discipline’s methods of organizing written discourse; organization is random, simplistic or inappropriately sequential, and rarely (if ever) contributes to the overall goals; some development of ideas is evident, but there is little insight, focus or logic; the writing lacks internal coherence, using few or inappropriate transitional devices; the reader has difficulty following the progression of the reasoning or ideas</p>	<p><u>3: Mastery:</u> The writing is styled and eloquent, with an easy flow, rhythm, and cadence; sentences have clear purpose and varied structure; sentences and paragraphing are complex enough to show skill with a wide range of rhetorical, disciplinary, or generic conventions; the writer chooses words for their precise meanings and uses an appropriate level of specificity, illustrating his/her facility with the discipline’s discourse; mechanics (spelling, punctuation, grammar, usage, and paragraphing) enhance overall readability and purpose; almost entirely free of errors, evidence of careful editing and proofreading</p> <p><u>2: Good:</u> The writing is appropriately styled and has an easy flow, rhythm, and cadence; sentences are purposeful and varied in structure; sentences and paragraphing show an appropriate use of rhetorical, disciplinary, or generic conventions; the writer usually chooses words for their precise meanings and uses an appropriate level of specificity, illustrating his/her understanding of the discipline’s discourse; mechanics (spelling, punctuation, grammar, usage, and paragraphing) contribute to overall purpose; almost free of errors, evidence of editing and proofreading; when errors do occur, they do not detract from readability</p> <p><u>1: Some Evidence:</u> The writing illustrates some aspects of polished style and rhythm appropriate to the discipline/genre; sentences are varied in structure and sometimes show the writer’s understanding of how to use rhetorical, disciplinary, or generic conventions; the writer sometimes chooses words for their precise meanings and some level of specificity is evident; mechanics (spelling, punctuation, grammar, usage, and paragraphing) contribute to overall purpose; errors may occur, but they usually do not detract from readability</p> <p><u>0: Insufficient Evidence:</u> The writing illustrates no (or very little) ability to use polished style and rhythm; sentences often lack purpose, with little variety in structure; sentences and paragraphing show a lack of understanding of how to use rhetorical, disciplinary, or generic conventions; word choice is often inappropriate and generalized, showing little understanding of disciplinary discourse; mechanics (spelling, punctuation, grammar, usage, and paragraphing) detract (or rarely contribute to) overall purpose; errors occur throughout, illustrating an inability to control language or a severe lack of editing and proofreading</p>

A random selection of papers produced in Spring Quarter 2009 in Biology 100LW, Experimental Biology Laboratory, Engineering 190W, Professional Communications in the Technical World, and Writing 139, Advanced Expository Writing, were collected for the 2009 Upper-Division Writing Assessment Project.

Six readers, all with significant writing instruction experience and a strong commitment to better understanding the quality of student writing produced through UCI's upper-division writing requirement, assessed the quality of the writing products from Biology 100LW, Engineering 190W, and Writing 139. Three of the readers, Ava Arndt, Eva Wessell, and Brook Haley, serve as instructors for lower-division writing courses at UCI. A fourth reader, Michael Leon, serves as the Associate Dean for the School of Biological Sciences, and has been actively involved in various initiatives within Biological Sciences designed to strengthen student writing skills. A fifth reader, Jeff Foresta, is a lecturer in the School of Engineering, was involved in the design of Engineering 190W, and has served as the instructor for the course on numerous occasions. An expert in writing external to UCI, Jacqueline Rhodes, is a Professor of English and former Upper-Division Writing Director at CSU San Bernadino, and served as the sixth reader for this project.

In preparation for the Upper-Division Writing Assessment on August 27 and 28, 2009, the Campus Writing Coordinator met with the Associate Deans for Biological Sciences and Engineering to discuss and review the rubric along with two sample papers. The goal of this meeting was to discuss the four writing categories contained within the rubric and the discipline-specific writing expectations for Biology and Engineering. A week prior to the assessment, all six readers were sent the Upper-Division Writing Assessment Rubric along with 2 sample papers (one from Biology 100LW and one from Engineering 190W) identified by Jonathan Alexander, Campus Writing Coordinator, and Lynda Haas, Course Director for Writing 39B, as reflecting both a range of writing quality based on the rubric's four categories and the distinctive nature of scientific writing. The readers were asked to review the papers and assign scores to each of these.

The first morning of the assessment started with a group discussion about the projects' goals, the lessons learned from the 2008 Pilot Assessment of Upper-Division Writing, and the distinctive nature of academic writing as a function of its disciplinary frame. The assignment prompts were not provided to the readers, based on the view that student writing produced in upper-division writing courses should rhetorically situate itself, and that it should be able to stand on its own, in that it addresses the aims, goals, and contexts for the writing. As a result, the success of this assessment project required a discussion among the readers about the distinct disciplinary conventions and organizational methods associated with academic writing in Biology, Engineering, and Humanities. Following this discussion, the readers reviewed the assessment rubric, the 2 sample papers, and discussed the assignment of writing scores to the sample papers. On three subsequent occasions to the initial training session, the readers collectively reviewed and discussed 5 additional sample papers to strengthen agreement of what constitutes achievement of the 4 writing traits contained in the Upper-Division Writing Assessment Rubric.

After this initial training session on the morning of August 27, 2009, readers were divided into 2 reading teams, with all members of a given team reading the same set of papers. All papers were read by three readers, with each individual reader assigning a score for each writing trait contained within the rubric. As papers were scored, Natalie Schonfeld monitored and tabulated the results. In order to strengthen inter-rater reliability, for any paper where the difference between the overall scores assigned by the three readers was greater than 2, one of the readers was asked to re-read the paper in question to confirm the score they initially assigned to the paper in question.

Table 2 displays the reliability coefficients for both the individual writing categories and the overall scores, by course and for all upper-division writing products assessed for this project. The overall

reliability coefficients for all upper-division writing papers and for each of the courses suggest that the rubric has high overall reliability. At the same time, the reliability coefficient values for the four writing categories by course and across upper-division writing products suggest that further refinement is needed in order to strengthen inter-rater reliability. In reviewing the reliability coefficients by course, the findings suggest that the Upper-Division Writing Assessment Rubric is most reliable in its ability to capture the writing quality of Writing 139 papers, and least reliable in its ability to capture the quality of writing in Biology 100LW papers. When reviewing the reliability coefficients across courses, the values suggest that the rubric is most reliable in its ability to capture students' ability to demonstrate critical thinking and analysis through their writing and least reliable in its ability to capture students' ability to demonstrate their understanding and application of generic and disciplinary conventions within their writing.

Table 2: Alpha Reliability Coefficient Values by Rubric Category and Overall

	Category 1: <i>Critical Thinking & Analysis</i>	Category 2: <i>Evidence & Research</i>	Category 3: <i>Development & Structure</i>	Category 4: <i>Generic&Disciplinary Conventions</i>	OVERALL
Writing 139 (n=24)	.525	.627	.606	.577	.873
Biology 100LW (n=24)	.592	.427	.443	.278	.826
Engineering 190W (n=24)	.737	.598	.530	.372	.859
ALL PAPERS (n=72)	.581	.571	.561	.473	.855

In order to determine the validity of the assessment results, instructor grades were collected for each of the papers used in this project and compared to the assessment scores. A correlation was then performed to determine if there exists a relationship between the grades students received on their upper-division writing papers and the scores assigned through the use of the Upper-Division Writing Assessment Rubric. The level of significance selected for this analysis was $p < .05$. The results, presented in Table 3, suggest that there is a positive and significant relationship between grades received and the assessment results for all upper-division writing papers though the strength of that relationship is moderate. Further, the results show that the strength of the relationship between grades and assessment scores is greatest for the Writing 139 papers and weakest for the Biology 100LW papers. It is interesting to note that the results from the 2008 Pilot Assessment of Upper Division Writing also found the strongest positive relationship between grades and assessment scores among the Writing 139 papers. Further, the fact that the instructors for both Biology 100LW and Engineering 190W shared the Upper-Division Writing Rubric with their students, and the Engineering faculty used the rubric to assign paper grades suggests that the understanding of these writing categories within different disciplinary frames yields different quality interpretations.

Table 3: Paper Grades and Assessment Scores

	Grades	Assessment Scores	Pearson's R Value
Writing 139 (n=24) *	82.52	5.58	.494
Biology 100LW (n=24)	80.79	5.57	.200
Engineering 190W (n=24)	87.64	6.08	.220
ALL PAPERS (n=72) **	83.65	5.75	.323

**p<.01, *p<.05

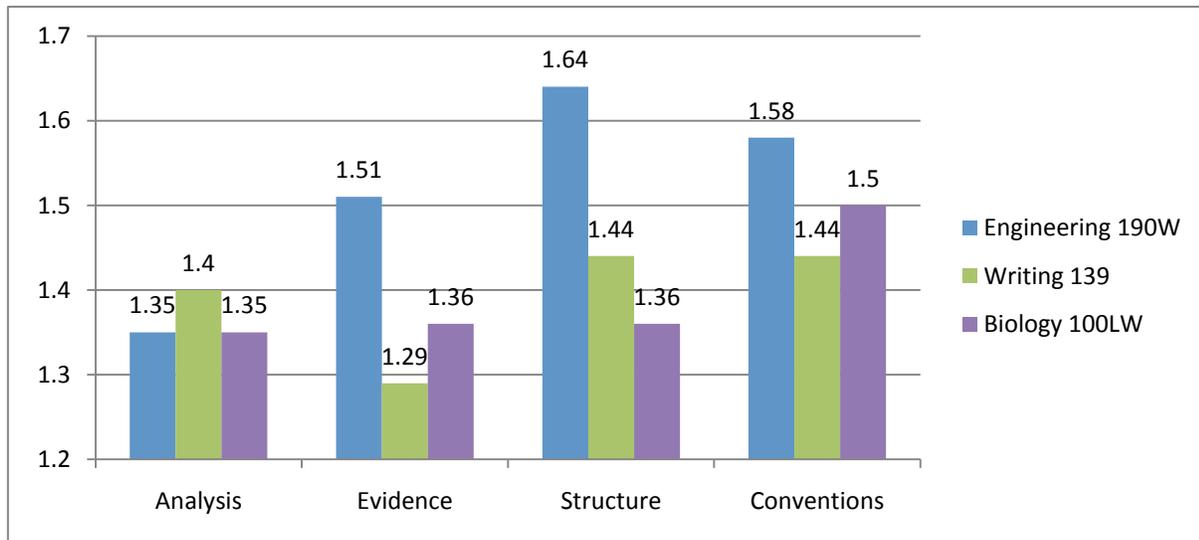
The analysis of the assessment results suggest that while the Upper-Division Writing Assessment Rubric is reliable overall, it is a more valid instrument for the Writing 139 papers than for either the Biology 100LW or the Engineering 190W papers, when defined as the relationship between assessment scores and grades received. At the same time, because both Biology and Engineering used or discussed this rubric as part of their instruction, the findings suggest not only that different disciplines may define these writing categories differently but also that the writing categories may not in fact effectively capture discipline-specific writing expectations.

The discussion with the readers upon completion of the assessment of upper-division writing papers confirmed these findings. The readers spoke at length about the differences in the writing products produced by each of these courses and the ways in which the nature of disciplinary writing seemed to facilitate and/or hinder student's ability to demonstrate their achievement of the writing skills and abilities delineated within the rubric. In discussing possible revisions to the Upper-Division Writing Assessment Rubric, the readers suggested that the rubric should be modified to include the use of data tables and visuals within student writing. The readers noted how the representation of data and the use of visuals within the writing products needed to be included within one of the rubric's writing categories, as these elements had the potential to either strengthen or detract from the paper's effectiveness in the development of both its purpose and argument or its analysis of evidence.

Student Writing Skills

The upper-division writing quality results, as defined by the Upper-Division Writing Assessment Rubric, are presented in Graph 1.

Graph 1: Upper-Division Writing Assessment Results



The assessment results found the Engineering 190W papers to be stronger than both the Writing 139 and Biology 100LW papers in the categories of evidence, structure, and conventions. Regardless of the upper-division writing course, all papers were found to be strongest in the “Generic and Disciplinary Conventions” category. Both the Biology 100LW and Engineering 190W papers were found to be weakest in the “Critical Thinking and Analysis” category while the Writing 139 papers were found to be weakest in the “Use of Evidence and Research” category. An ANOVA was performed to determine if the observed differences in writing quality between courses were significant. The level of significance selected for this analysis was $p < .05$. The results, presented in Table 4, show there are no significant differences in the quality of student writing as a function of course.

Table 4: Comparison of Mean Assessment Scores by Upper Division Writing Course

	Writing 139 (n=24)	Biology 100LW (n=24)	Engineering 190W (n=24)
Critical Thinking and Analysis	1.4	1.35	1.35
Use of Evidence/Research	1.29	1.36	1.51
Development and Structure	1.44	1.36	1.64
Generic and Disciplinary Conventions	1.44	1.5	1.58
OVERALL SCORE	5.58	5.57	6.08

Overall, the quality of student writing demonstrated in these papers was lower than expected. As displayed in Table 5, while the majority of papers showed some evidence of achievement of the four writing categories, only 8% of the Writing 139 papers, 4% of the Biology 100LW, and 13% of the Engineering 190W papers demonstrated “good” quality in all four writing categories. In fact, the writing quality of the papers assessed in 2009 was lower than the writing quality observed in the papers used in the 2008 Pilot Assessment of Upper-Division Writing.

Table 5: Quality of Student Writing

Quality Scores by Category	1	2	3	4	OVERALL
Writing 139 (n=24)					
Insufficient Evidence (0-.99)	3 (13%)	5 (21%)	4 (17%)	1 (4%)	4 (17%)
Some Evidence (1-1.99)	17 (71%)	15 (63%)	14 (58%)	17 (71%)	18 (75%)
Good (2-2.99)	4 (17%)	4 (17%)	6 (25%)	5 (21%)	2 (8%)
Mastery (3)	0	0	0	1 (4%)	0
Biology 100LW (n=24)					
Insufficient Evidence (0-.99)	3 (13%)	4 (17%)	2 (8%)	0	4 (17%)
Some Evidence (1-1.99)	18 (75%)	17 (71%)	18 (75%)	21 (88%)	19 (79%)
Good (2-2.99)	3 (13%)	3 (13%)	4 (17%)	3 (13%)	1 (4%)
Mastery (3)	0	0	0	0	0
Engineering 190W (N=24)					
Insufficient Evidence (0-.99)	3 (13%)	2 (8%)	1 (4%)	1 (4%)	1 (4%)
Some Evidence (1-1.99)	16 (67%)	16 (67%)	14 (58%)	17 (71%)	20 (83%)
Good (2-2.99)	5 (21%)	6 (25%)	9 (38%)	6 (25%)	3 (13%)
Mastery (3)	0	0	0	0	0

^a Category 1 is “Critical Thinking and Analysis”; Category 2 is “Use of Evidence/Research”; Category 3 is “Development and Structure”; Category 4 is “Generic and Disciplinary Conventions”.

Overall, the findings suggest that students are not able to demonstrate the level of quality in their writing that would be expected for the upper-division writing requirement. The majority of papers, regardless of the course, showed some evidence of the four writing categories, with only 8% showing achievement of all writing categories at a quality level of good or higher. All the upper-division writing papers were strongest in the area of disciplinary and generic conventions and lowest either in the area of critical thinking and analysis or use of evidence and research. Though there the differences observed in the quality of writing students produced as a function of which upper-division writing course were not significant, when considered in light of the reliability coefficients, they suggest the need for greater clarity about the aims of upper-division writing across disciplines. Further, they reinforce the importance of the structure and scope of the writing assignments students are provided and the degree to which these assignments allow and require students to both achieve and demonstrate the level of writing expected upon completion of their upper-division writing course. Most importantly, the results of this project suggest that students are not able to demonstrate the quality of writing expected for upper-division writing courses. As noted by the readers at the conclusion of the assessment, nearly all the papers assessed, regardless of the discipline, were conceptually poor, with many papers being weak in their ability to articulate the purpose of their writing.

Student Background and Writing

In order to better understand the writing quality in the sample of Writing 139, Biology 100LW, and Engineering 190W papers, data was collected both about students' enrollment and language status. As displayed in Table 6, nearly all of Writing 139, Biology 100LW, and Engineering 190W sample papers were produced by direct entrants from high school. Because of the small number of transfer student papers in the sample, the Spring 2009 enrollments for Writing 139, Biology

100LW, and Engineering 190W were reviewed to ascertain whether the assessment sample was representative of the enrollment status of students enrolled in these courses. No significant differences emerged between the individual course enrollments and the paper samples used for this assessment project as it pertains to student enrollment status.

Table 6: Enrollment Status by Upper-Division Writing Course

Enrollment Status	Writing 139	Biology 100LW	Engineering 190W	All
High School	19 (79%)	24 (100%)	22 (92%)	65 (90%)
Transfer	5 (21%)	0	2 (8%)	7 (10%)

Table 7 shows that the majority of students whose papers were assessed for this study were non-Native English speakers. Regardless of the course, half of the papers which were randomly selected for this assessment were produced by students who grew up in households where either only another language or both English and another language were spoken. For Biology 100LW, over 70% of all papers assessed were produced by students who grew up in households speaking either another language or both English and another language. Again, the Spring 2009 enrollments for Writing 139, Biology 100LW, and Engineering 190W were reviewed to ascertain whether the assessment sample was representative of the language status of students enrolled in these courses with no significant differences emerging from that analysis.

Table 7: Language Status by Upper Division Writing Course

Language Status	Writing 139	Biology 100LW	Engineering 190W	All
English Only	12 (50%)	7 (29%)	12 (50%)	31 (43%)
English & Another Language/Another Language Only	12 (50%)	17 (71%)	12 (50%)	27 (57%)

An analysis of variance, displayed in Table 8, was performed to identify the effects of enrollment status, and language status, respectively, on the four individual writing categories and the overall writing assessment scores. The level of significance selected for these analyses was $p < .05$. The results from the analysis of variance concerned with the effect of enrollment status show that UCI students who enroll directly from high school produced higher quality writing products, as reflected both in the quality scores assigned to the four writing categories and the overall writing quality scores, than did their transfer student counterparts. In addition, significant differences in quality emerged in the writing category "Use of Evidence/Research" when comparing the writing produced by students who came to UCI directly from high school versus transfer students. Finally, there are no observable or significant differences in writing quality as a function of language status.

Table 8: Mean Writing Assessment Values as a Function of Enrollment and Language Status

<u>Mean Writing Assessment Values and Enrollment Status</u>	High School	Transfer
Critical Thinking and Analysis	1.39	1.14
Use of Evidence/ Research*	1.43	1.05
Development & Structure	1.51	1.19
Generic & Disciplinary Conventions	1.53	1.28
OVERALL SCORE	5.86	4.67
<u>Mean Writing Assessment Values and Language Status</u>	English Only	English & Another/ Another Only
Critical Thinking and Analysis	1.35	1.37
Use of Evidence/ Research	1.34	1.42
Development & Structure	1.49	1.47
Generic & Disciplinary Conventions	1.56	1.47
OVERALL SCORE	5.75	5.74

**p<.01, *p<.05

Conclusions and Recommendations

The 2009 Upper-Division Writing Assessment was designed with three goals in mind: (1) to assess the degree to which the Upper-Division Writing Assessment Rubric captured shared writing skills and techniques across academic disciplines, (2) to assess the quality of student writing produced in upper-division writing courses, and (3) to determine whether such student characteristics as first language and transfer vs. high school status impact the quality of student writing. The Upper-Division Writing Assessment Rubric, modified following the 2008 Pilot Assessment Project, proved to be a useful tool for assessing the quality of writing produced in upper-division courses. While the rubric was found to be both a reliable and valid tool, improvements to the instrument will further strengthen its ability to effectively capture the quality of student writing produced in upper-division writing courses, specifically as they related to the “Development and Structure” and “Generic and Disciplinary Conventions” categories. The review of student writing showed that the quality of student writing is lower than had been expected. While the papers were consistently strongest in the use of generic and disciplinary conventions, approximately 80% of the papers only showed some evidence of achievement of all four writing categories. The papers were found to be weakest in either critical thinking and analysis or use of evidence/research, the two primary categories by which a student demonstrates their ability to craft and detail the paper’s purpose and argument. In addition to the low quality of the papers, the low reliability scores for the development and structure and generic and disciplinary conventions categories suggests that the goals for upper-division writing may not be consistent across courses. Finally, the differences observed in the writing quality produced by students was different as a result of their enrollment status, with significant differences being observed in writing quality between transfer students and those who enrolled at UCI directly from high school in the area of use of evidence and research.

In light of these findings, the following recommendations emerge:

While there is great value in the distinctiveness of upper-division writing courses as a result of the given discipline’s approach to writing, it is critical that agreement be reached on the goals of the upper-division writing requirement. The Upper-Division Writing Assessment Rubric is an effort to reflect that need. The findings from this year’s project point to the complexity of this task, and the need for a greater understanding of how the discipline shapes the organization and structure of the writing. As an example, it would be helpful to modify the rubric to include some quality descriptors

related to the use and representation of data and visuals within students' writing and its relationship to the development of the paper's argument and its overall ability to analyze and effectively utilize evidence.

In addition to making modifications to the rubric so as to most accurately capture what constitutes writing quality across disciplines, upper-division writing courses and assignments need to provide students with the opportunity to practice, achieve, and demonstrate the writing skills and abilities reflected by the rubric, most notably critical thinking and analysis and the use of evidence and research.

There are some differences in the quality of writing produced by students as a result of their enrollment status, as had been the case in the 2008 Pilot Assessment of Upper-Division Writing. This project found that transfer students are more likely to produce lower quality writing products than their peers who enrolled at UCI directly from high school, with significant differences being observed in the "Use of Research/Evidence" category. It is recommended that both the reasons why these differences exist and strategies for minimizing these differences in writing skills be explored.