
Expectations and Challenges of Non-native University Writers at the Outset of Discipline-specific Study

K. James Hartshorn, Brigham Young University, Utah, USA

Norman W. Evans, Brigham Young University, Utah, USA

Abstract

Little is known about how best to prepare non-native students matriculated at universities in the United States to succeed in discipline-specific writing. While some studies have suggested differences in the types and volumes of writing across disciplines, such studies have compared very few disciplines simultaneously and have not always examined the disciplines most commonly studied by international students. Thus, this study seeks to fill an important gap in the literature by examining the perspectives of university professors regarding their expectations and purposes for student writing as well as their observations about the greatest writing challenges their students face within five of the most popular disciplines for international students at the undergraduate level. These include business, biology, computer science, engineering, and psychology. Results suggest meaningful differences across disciplines in terms of writing volumes, purposes, and expectations though no differences were observed across fields for the most prevalent writing challenges. This paper also discusses the possible need for non-native writers to have additional opportunities to continue to develop their discipline-specific writing skills along with more feedback. While additional discipline-specific writing instruction may not always be feasible, we encourage program administrators and practitioners to consider tailoring writing instruction to meet the needs of learners preparing for various fields of study.

Keywords: Discipline-specific writing, English as a Second Language, Writing expectations and challenges

Introduction

More than three decades ago, Horowitz (1986) argued that we cannot fully grasp what we need to teach our writing classes unless we understand what our

students are being asked to write once they leave our classroom. This observation is as cogent today as it was then. What we teach our students must be relevant to the ways they will need to use the language. However, in the case of teaching English as a second language (ESL) students bound for undergraduate studies in various disciplines, knowing what learners need to do with their writing may not be as straight forward as it appears.

Some might think of university writing as simply what is taught in first-year composition courses such as essays and term papers. While this is certainly descriptive of some university writing, it is not universally applicable across a college campus. Writing in university courses may be as diverse as the disciplines that require writing (e.g., Ferris, 2015; Johns, 1981; Leki, 2007; Stoller & Robinson, 2015). The need for resources such as *Write Like a Chemist* (Robinson, Stoller, Costanza-Robinson, & Jones, 2008), *Writing Like an Engineer* (Winsor, 2013), and *The Writers Guide to Psychology* (Kaufman, 2010) demonstrate that writing can serve many purposes and may take on multiple forms. Understanding writing expectations and student challenges in the various disciplines is essential if practitioners are to provide the specific instruction ESL students need prior to admission and the support they need once they have been matriculated.

The ultimate intent of this study is to help practitioners involved in writing instruction to better prepare ESL students to meet the writing expectations of their professors at the beginning of study within their chosen field. According to Chow and Bhandari (2011), over 80% of the 764,495 international students studying in the United States in 2011 spoke English as a second or foreign language coming from countries such as China, Saudi Arabia, South Korea, and Japan. Since little data are available regarding the writing expectations and challenges these ESL students face once they step into their chosen fields, this study was designed to reduce the gap in our understanding about how best to prepare and to continue to support ESL learners for the discipline-specific writing they will encounter in their first semester of undergraduate study within their chosen disciplines. Given that international students tend to favor certain disciplines over others (Chow & Bhandari, 2011), we determined to conduct a study examining the perspectives of university professors regarding their expectations and purposes for student writing as well as their observations about the greatest writing challenges their students face within five of the most popular fields of study

for international students (Chow & Bhandari, 2011). Thus, this study examines perspectives about student writing within five disciplines including business, biology, computer science, engineering, and psychology. This study should be beneficial to TESOL practitioners, intensive English programs, those who teach English for academic purposes, and many others interested in the success of ESL writers on university campuses.

Review of Literature

While the U.S. has numerous English language programs that seek to provide their students with the skills they need to successfully engage the curricula at English-medium universities, Moran (2013, p. 1) suggests there is “little empirical evidence” informing “the content and curricular goals of such programs.” In addition, scholars have described university approaches to writing for matriculated students as “poorly addressed,” without being adequately “systematic” or “coherent” (Garbati, McDoland, Meaning, Samuels, & Scurr, 2015, p. 4). Such claims suggest that we need much more understanding of the writing challenges and expectations ESL students will face as they transition from intensive English programs into discipline-specific study at English-medium universities. While some research regarding expectations and challenges in university writing has provided important insights, much more research is needed to contextualize previous work and to address the many questions that have not yet been fully answered.

We begin by considering relevant findings of recent research. Some studies have shed light on the volume and types of writing done by under graduate students. For example, Garbati et al. (2015) examined 215 syllabi and conducted faculty surveys and focus groups emphasizing undergraduate university writing in history, kinesiology, and business. They noted that on average students could expect to write approximately 2.5 assignments per course or about 12 assignments per year. These assignments varied in their number of pages and their purposes which ranged from testing student content knowledge to providing students with opportunities to “develop, refine, and practice necessary writing skills” (p. 7). Such findings are consistent with those of Graves, Hyland, and Samuels (2010) who analyzed 179 syllabi for undergraduate writing assignments from 17 different disciplines. They also found students write about 2.5 assignments per course and that nearly half of those assignments were just four pages or less.

However, writing does not appear to be equally distributed across disciplines. For example, Garbati et al. (2015) found that history students wrote almost twice as much as those studying kinesiology or business. Similarly, Graves et al. (2010) observed that their humanities students wrote more than twice as many pages compared to their students in social science programs. Though the groupings are somewhat different, Moran (2013) also gathered syllabi and surveyed professors and students. She observed that students in the humanities, arts, and social sciences were given significantly more writing assignments than those in math, engineering, or other sciences. She also found that writing for the psychology courses included much more variety compared to the writing done for the chemistry classes. Thus, while some students have considerable opportunities to engage in course-related writing, others may produce very little if any writing during a particular course. Such discrepancies have important implications for TESOL practitioners as they prepare ESL students for writing within specific disciplines as they begin their study.

Types of writing also appear to vary across contexts though categorizing them can be challenging. Attempts to classify university writing range from Horowitz' (1986) seven categories, to Carter's (2007) four meta genre's, Gardner and Nesi's (2012) 13 genre families, and Hardy and Friginal's (2016) four dimensions. One of the most prevalent types of writing is the research paper. Horowitz (1986) found it to be the most common type of writing for the undergraduate students he observed. This seems fairly consistent with findings from Graves et al. (2010), though the actual percentage of the assignments that could be termed research could range from 31% to 63% depending on the specific definition used. Conversely, Melzer (2009) reported that only 6% of the assignments he analyzed were research-based term papers though this smaller proportion may have been due to the large number of assignments he was unable to successfully categorize. Gardner and Nesi (2012) point out the problems associated with attempts to categorize similar writing assignments when there may be important differences across those assignments in various contexts. Melzer (2009, p. 252) further suggests that it "cannot be classified as a genre since research writing varies to such a degree from discipline to discipline and even from instructor to instructor." This is an area that needs additional study if we are to better grasp the kinds of writing ESL students are expected to produce.

In addition to the more obvious types of writing that would be expected in undergraduate study, such as research papers, some scholars also note the prevalence of what could be described as short answer writing often associated with assessments. These might be described as open-ended responses requiring just one or two words or phrases. In one study Melzer (2003) observed that 23% of the course assignments he examined were made up of short answer question types. In another study, he found that 21% of the assignments were short answer (Melzer, 2009). Some researchers have noted that the short answer response was the only type of writing done in some of the courses they examined (e.g., Melzer, 2009; Moran, 2013). Other scholars have appropriately highlighted the inherent challenge in attempting to categorize this type of writing. For example, Graves et al. (2010) suggested that it should not be considered under the traditional definition of writing and Melzer (2009, p. 256) described short answer writing as the “one school genre that resists the application of current genre theory.” Despite its anomalous nature, if short answers make up a substantial amount of student writing, it seems that they need to be prepared to write effectively in this context.

In many recent studies, there seems to be a gap between the writing skills professors expect and the writing that students produce, suggesting that many students are unprepared to successfully engage in the kinds of writing required as they transition to study within their chosen disciplines. For example, Soter and Smith (2016) who examined the business writing of undergraduate students noted that students often struggle despite completing multiple composition classes beforehand. While business professors assume that students new to the discipline will have the skills needed to write effectively in their courses, they are frequently disappointed to find that their students “show incredible weakness in writing” (p. 2) including problems with grammar, spelling, coherence, transitions, clarity, and so forth. These observations of students who are unprepared to write effectively seem consistent with the findings of other researchers examining a variety of disciplines (e.g., Garbati et al., 2015; Moran, 2013; Perin, 2013).

In addition to expectations associated with linguistic accuracy, other unmet expectations of professors appear to be discipline-specific. For example, Moran (2013) noted that while psychology professors want students to demonstrate course content, synthesize ideas, and connect them to relevant theory, chemistry professors emphasize that their students need to write with the detail and clarity that

would allow for replication of their lab work and experiments. In chemistry, the emphasis is largely on effectively capturing procedures and discussing the analysis and results appropriately. Beyond such differences, Moran (2013, p. 84) also noted that while many professors claim that students simply need general academic writing skills to be successful in their classes, many frustrations over student writing are actually due to expectations that are “implicitly discipline-oriented” in ways that may go “beyond the instructor’s awareness.” If true, expectations associated with linguistic accuracy as well as discipline-specific conventions need to be made much more explicit for students much earlier.

Additional observations from the literature have to do with other kinds of differences across disciplines. For example, Garbati et al. (2015) noticed that the history and kinesiology professors spent more time teaching students about writing within the discipline than the business professors. In doing so, emphases varied such as careful attention to grammar in history and a focus on APA style in kinesiology. Though all of the professors felt quite confident in their own professional writing within their discipline, they varied a great deal in their preparation and confidence to be able to successfully teach their students how to write effectively within the discipline. Thus, the learning experience associated with writing with various disciplines and which aspects of writing are most important may vary widely for students.

Relevant to preparation to teach writing within a discipline is the nature of the writing feedback teachers provide. The literature shows some variation across contexts in terms of feedback provided by professors. Graves et al. (2010) noted that a majority of the syllabi they analyzed included no information about specific learning goals associated with writing assignments, the rubrics that would be used to evaluate the writing, or anything about feedback procedures. Moreover, Garbati et al. (2015) lamented that some kind of writing feedback was only seen in about 5% of the courses they examined. Melzer (2009) observed that nearly 13% of the professors in his study collected at least one rough draft and provided some kind of feedback to help the students improve the quality of their final draft. In their study, Graves et al. (2010) noted that about 14% of the assignments they analyzed included some form of feedback based on written notes or meetings with the professor or teaching assistant. Each of these scholars mentioned the potential benefits of utilizing more nested writing assignments where students could “submit com-

ponent parts of an assignment and receive feedback about their writing as they work toward a final product” (Garbati et al., 2015, p. 2).

This brief review of literature has provided insights regarding undergraduate writers in university contexts. Generally, there seems to be a substantial gap between the kind of writing skills professors expect and the quality of the writing students produce. Despite this gap, many professors feel poorly qualified to help students improve their writing. Others feel too overloaded with other priorities to provide the additional writing instruction and feedback the students need. While a few studies have reported on various types of writing and their distribution across the disciplines, there are confusing inconsistencies in how writing assignments have been categorized, making it difficult to aggregate information across multiple studies. At least some research has been conducted in a number of disciplines such as business, chemistry, history, kinesiology, and psychology as well as broader categories such as humanities and social sciences.

While such studies have provided very useful information, not all of these fields are those most commonly pursued by ESL students transitioning from intensive English study to the university. Moreover, since the findings appear in different studies with varying methods, it is difficult to make appropriate comparisons across disciplines. Therefore, the intent of this study was to examine the perceptions of professors across five of the most common disciplines for ESL students (Chow & Bhandari, 2011) to determine how well their students are prepared to engage in discipline-specific writing at the outset of their study. This research focuses on the beginning of study within specific fields as a way of determining the effectiveness of intensive English programs and TESOL practitioners in preparing students for discipline-specific writing. With this in mind, the following research questions were articulated.

Research Questions

To what extent do each of the following differ across initial discipline-specific courses within each field?

1. The number of pages and types of writing.
2. The importance of various aspects of writing such as use of genre, word choice, specific types of vocabulary, and linguistic accuracy.

3. The percentage of writing that receives feedback from professors and that may be resubmitted.
4. The main purposes for writing.
5. The greatest writing challenges.

Method

An essential aspect to understanding the challenges international students face while studying in the US is knowing where and what they are studying. We used *Open Doors* (Chow & Bhandari, 2011) which provides statistical information about international students in the US, to identify colleges and universities that have the highest percentages¹ of international students. According to *Open Doors'* data, over 81% of all international students studying in the US in 2011 were studying in three types of institutions that offer undergraduate degrees: Doctoral (64%), Masters (17%), or Baccalaureate (4%) degree granting institutions. As such, we focused our data collection on these three types of institutions. Thirty institutions that enroll the largest numbers of international students were selected for the study through a stratified selection process (10 PhD granting institutions, 10 MA granting institutions, 10 BA granting institutions). We also identified the five disciplines that were the most popular among international students according to *Open Doors* (Chow & Bhandari, 2011). These included biology, business, computer science, engineering, and psychology.

Our original goal was to obtain data from at least 20 institutions per discipline. However, the 30 institutions originally identified did not provide an equal distribution of the disciplines of interest. They included biology (30), business (27), computer science (27), engineering (13), and psychology (30). Therefore, our original list of institutions was expanded with additional schools reporting the highest proportions of international students—this was particularly necessary for engineering since some of our originally selected schools did not have engineering programs.

For each discipline at each institution, one class was chosen that represented the most essential beginning course for that field. In many cases, the most appropriate

¹ These included schools such as the Illinois Institute of Technology (52% international students), Massachusetts Institute of Technology (33%), Carnegie Mellon University (33%), and so on.

course was obvious while in other cases we needed to consult with department personal to help determine which course to use. We excluded one-credit survey courses and prerequisites. Our selections included courses such as Psychology 101 or Biology 105. In some cases, course types varied across institutions. For example, the initial class chosen for business included courses in business management, economics, and accounting depending on the institution.

Instrument

Following an extensive review of the literature, an on-line survey using research software developed using Qualtrics (2015) was designed to elicit data from professors that would help answer the research questions. It includes items about the types and amounts of writing included in the respective courses along with questions about the writing purposes and the greatest writing challenges observed in each course. These questions were specifically used to provide TESOL practitioners with insights that could inform their teaching (see Appendix A for the complete survey). Once the instrument had been developed, it was piloted with faculty members at three institutions that were not included in our final survey population. Minor adjustments were made to the survey following the pilot process before being sent to the target institutions. The survey and data elicitation procedure was approved by our university institutional review board.

Participants

Participants in this study were professors targeted because they taught specific introductory courses within the selected disciplines at the institutions of interest. To facilitate participation, prospective respondents were identified at each institution based on the courses they taught. This process included searching online course catalogs as well as phone conversations with department staff and professors to locate the most appropriate individuals to complete the survey. They were contacted by phone and invited to participate. The specific intent of this study was to glean insight that could help TESOL practitioners better prepare ESL writers as they transition to their first semester of study. Nevertheless, no mention of this ESL learner focus was made to the participating professors since we did not want this focus to be a source of distraction that might impact any of their responses. The 182 individuals who agreed to participate were then sent the survey via an email link. Nevertheless, to help ensure an adequate response rate, there was some

overlap of professors within a given discipline at a particular institution. A total of 157 surveys were completed and returned. We attribute the very high return rate (86%) to the extensive effort taken to make personal contacts with potential participants. Data analyzed from the completed surveys represents 114 university departments across the five disciplines. In cases where multiple individuals provided quantitative data for a single discipline within the same institution, responses were averaged. The breakdown for participating professors and institutional departments is illustrated in Table 1.

Table 1. Breakdown of Professors by Department

Disciplines	Professors	Departments
Biology	37	24
Business	35	24
Computer Sci	23	21
Engineering	34	24
Psychology	28	21
Totals	157	114

Analyses

A number of analyses were needed in order to answer the research questions. These include one-way, two-way, and multivariate analyses of variance along with chi square analysis depending on the specific question and the type of data elicited. In addition to the objective survey items, respondents were presented with a number of open-ended questions inviting them to identify their perceptions of the purposes and challenges of student writing in their courses. Responses from these items were reviewed and coded by each of three researchers based on commonalities across answers to determine patterns and emerging themes (Pell Institute, 2017; Taylor-Powell & Renner, 2003). The analysis of each researcher was then reviewed by another to verify the accuracy of the coded themes. This process continued until there was complete agreement in the research team on the assigned codes.

Results

This section provides results of analyses designed to answer the research questions for writing at the beginning of study within each discipline. It includes in-

formation about the volume and types of writing, the relative importance of various aspects of writing, the percentage of writing that receives feedback from professors and that may be resubmitted, the main purposes for writing, and the greatest writing challenges students face.

The Volume and Types of Writing

The first research question addressed the volume and types of writing across the five disciplines. This section reports on four areas designed to help answer this question. These include differences in the volume of writing categorized as research and non-research, the percentage of various writing response types used in exams, and the percentage of writing that may be written by hand. While this question may seem unusual for university writing, its purpose was to help clarify the contexts in which students write as a means of helping TESOL practitioners to better prepare students for the university writing they will do in their first year of study within the field. Table 2 presents descriptive statistics for the volume of research and non-research writing by discipline.

Table 2. Pages of Research and Non-Research Writing by Discipline

Discipline	Research		Non-research	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Biology	30.14	14.18	45.80	20.36
Psychology	26.00	23.74	43.15	32.29
Engineering	19.71	10.59	33.88	19.06
Business	17.21	13.49	24.62	14.40
Comp Sci	4.80	3.35	9.67	7.78

Results show that not all disciplines produced the same number of pages of research writing, $F(4,45) = 2.90$, $p = .032$. This category of research writing included research proposals, reviews of literature, case studies, and various forms of field and lab research. The only statistically significant difference across the disciplines was that biology students produced more written pages than computer science students ($p = .029$, $d = 2.24$)². Nevertheless, relatively large standard deviations³ reveal substantial variability within the respective disciplines.

² Effect sizes are reported as Cohen's *d*, where small is .2 to .49, medium is .5 to .79, and large is $\geq .8$.

³ A test of homogeneity of variance suggested differences were marginal but adequate between biology and computer science, Levene's $s = 2.456$, $p = .059$, so data was not transformed for this analysis.

Similarly, different fields produced different numbers of pages of other types of writing as well, $F(4,62) = 5.795$, $p < .001$. This included various forms of writing such as summaries, analyses, book reviews, email and chatting, explanations of mathematical problem solving, technical writing and reflective writing kept in journals or notebooks. Students in biology courses produced significantly more non-research pages of writing than students in business ($p=.04$, $d=1.201$) or computer science ($p=.001$, $d=2.344$), and students in psychology courses produced significantly more pages of this kind of writing than those in computer science ($p=.004$, $d=1.43$).

In order to further address the first research question, the percentage of various writing response types used in exams was also analyzed. These included short answers, one-paragraph responses, multiple paragraphs, and a full paper. Responses are summarized in Table 3. Overall there was a significant interaction for discipline by writing assessment type, $F(12,436)=3.715$, $p < .001$. Though meaningful differences were not observed across discipline for the paragraph and the full paper, statistically significant differences were observed for the short answer, $F(4,109)=2.572$, $p=.042$, and multiple paragraph writing, $F(4,109)=5.467$, $p < .001$. There was a greater percentage of short answer writing in assessments in engineering than in psychology ($p=.036$; $d=.877$). In addition, business included a higher percentage of multiple paragraph writing than in computer science ($p=.007$; $d=.842$) or engineering ($p=.001$; $d=.978$).

Table 3. Writing-Based Assessment Types by Percentage

Discipline	Short		Paragraph		Multi Para		Full Paper	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Business	39.52	40.42	15.51	19.56	27.22	37.95	1.09	5.33
Psychology	33.73	37.12	11.50	18.11	19.08	27.16	2.35	8.87
Biology	45.25	35.31	19.45	20.16	9.53	15.15	4.94	16.14
Engineering	67.05	38.84	10.45	17.00	0.83	4.08	5.00	17.19
Comp Sci	51.84	40.27	24.48	29.15	3.85	10.06	0.79	3.64
Means	47.72	39.48	16.19	21.31	12.14	24.30	2.90	11.77

The final element of the first research question dealt with the amount of writing within each discipline that is allowed to be written by hand. Results are summarized in Table 4. As was the case with many of the preceding questions, statistically significant differences were observed across discipline, $F(4,70)=3.408$, $p=.013$. Yet,

the only statistically significant pairwise difference showed that students produced more hand writing in engineering than in psychology ($p=.003$; $d=1.58$).

Table 4. Percentage of Writing Allowed to be Handwritten by Discipline

Discipline	<i>M</i>	<i>SD</i>
Engineering	61.67	40.38
Business	46.52	38.72
Biology	44.27	39.72
Computer Sci	29.75	25.53
Psychology	15.38	31.07

The Importance of Various Aspects of Writing

The second research question addressed the relative importance of various aspects of writing. These five aspects of writing were defined for the respondent in the survey and were operationalized as genre (“the specific patterns and structure of the writing in the discipline”), word choice (“writers use vocabulary accurately to convey meaning with precision”), academic-level vocabulary (“words are academic and less colloquial or conversational”), discipline-specific vocabulary (“students use the specific vocabulary of the discipline”), and linguistic accuracy (“grammar, mechanics such as spelling, punctuation and so on”). Results are summarized in Table 5.

Though there were no statistically significant differences across the several fields for discipline-specific vocabulary or genre, significant differences were observed across discipline for word choice, $F(4,102)=4.939$, $p=.001$, linguistic accuracy, $F(4,102)=4.51$, $p=.002$, and academic vocabulary, $F(4,102)=6.0$, $p<.001$. Word choice was more important in business than in engineering ($p=.005$; $d=1.172$) or computer science ($p=.002$; $d=1.094$). Academic vocabulary was more important in biology than computer science ($p<.001$; $d=1.276$). Academic vocabulary was also more important in business than computer science ($p=.003$; $d=1.240$). Finally, linguistic accuracy was more important in psychology than computer science ($p=.009$; $d=1.017$) and more important in business than computer science ($p=.011$; $d=.932$).

Table 5. Importance of Writing Features across Discipline

Discipline	Discipline Vocabulary		Word Choice		Linguistic Accuracy		Academic Vocabulary		Genre	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Biology	3.06	0.83	2.77	0.90	2.43	0.74	2.82	1.04	2.27	1.02
Business	3.35	0.76	3.24	0.84	2.83	0.98	2.66	0.85	2.29	1.14
Comp Sci	2.78	1.30	2.08	1.20	1.88	0.94	1.58	0.75	1.98	1.24
Engineering	2.87	1.02	2.24	0.89	2.21	0.94	2.33	1.02	1.71	0.90
Psychology	2.83	0.89	2.73	0.98	2.88	0.92	2.40	0.75	2.18	1.10
Means	2.98	0.98	2.62	1.03	2.45	0.96	2.38	0.98	2.09	1.08

Writing Feedback and Resubmissions

The third research question addressed the extent to which writing receives feedback and is allowed to be resubmitted after revision. Results show that nearly 41% ($SD=35.21$) of student writing receives no feedback and that there are no significant differences across the disciplines for the percentage of writing that receives feedback. Furthermore, nearly 83% ($SD=26.35$) of student writing may not be resubmitted after revision. No significant differences were observed across discipline for the percentage of writing allowed to be resubmitted.

The Main Purposes for Writing

The fourth research question addressed the main purposes for writing within the first-semester of discipline-specific courses. These data were collected using an open-ended question type where participants wrote their responses. Table 6 displays theme descriptors tallied according to frequency of mention. It also breaks down percentages by discipline along with frequencies indicated parenthetically for each field. Describing the most frequently mentioned writing purpose, professors used language such as, “the main purpose of writing is to demonstrate knowledge” (engineering) and students need to “demonstrate understanding of material covered in lectures and explored in the weekly reading assignments” (biology). Other professors provided additional comments such as “in the process of demonstrating that knowledge, the student comes to know that they still need to develop their knowledge. Without the demonstration there is less motivation to do the learning” (business). Additional purposes mentioned frequently include synthesizing knowledge, reinforcing learning, report writing, argument development, applying knowledge, genre development, problem solving, and so on.

Table 6. Writing Purposes by Discipline

Theme References (N=17)	Disciplines (N=5)					
Descriptors Total	Biology	Business	CScience	Engineering	Psychology	
Demonstrate knowledge	75	25%(19)	17%(13)	16%(12)	21%(16)	20%(15)
Synthesize knowledge	31	42%(13)	13% (4)	3% (1)	13% (4)	29% (9)
Reinforce learning	22	27% (6)	14% (3)	14% (3)	18% (4)	27% (6)
Report writing	22	32% (7)	9% (2)	–	50%(11)	9% (2)
Argument development	18	39% (7)	11% (2)	11% (2)	6% (1)	33% (6)
Apply knowledge	17	6% (1)	29% (5)	6% (1)	12% (2)	47% (8)
Genre development	16	31%(5)	6% (1)	31% (5)	6% (1)	25% (4)
Solve problems	12	–	17% (2)	25% (3)	58% (7)	–
Analysis	9	–	44% (4)	–	22% (2)	33% (3)
Clarify thoughts	7	57% (4)	14% (1)	14% (1)	–	14% (1)
Communicate effectively	7	43% (3)	–	43% (3)	14% (1)	–
Critical thinking	6	–	67% (4)	17% (1)	17% (1)	–
Evaluate others work	5	20% (1)			20% (1)	60% (3)
Develop writing skill	5	20% (1)	40% (2)	–	–	40% (2)
Communication with teacher	4	–	25% (1)	25% (1)	–	50% (2)
Research writing	4	75% (3)	–	–	–	25% (1)
Collaborative writing	3	33% (1)	33% (1)	–	33% (1)	–
Total	263	71	45	33	52	62

In an effort to check for systematic differences for these writing purposes across the disciplines included in Table 6, a chi-square analysis⁴ was used. While most comparisons across discipline were negligible, statistically significant differences were observed for three of the 17 writing purposes identified in Table 6.

⁴ Standardized residuals (R) are used to show statistical significance (i.e., $p=.05$ where an absolute value of at least 1.96 is observed and $p=.01$ where an absolute value of at least 2.58 is observed).

The first and perhaps most meaningful of these was synthesizing knowledge, $\chi^2(4, N=31) = 14.645, p=.005$. These results⁵ indicate that the mention of synthesizing knowledge was significantly more frequent in biology than in the other disciplines and that it was mentioned significantly less frequently in computer science compared to the other fields. The second statistically significant comparison was observed for report writing, $\chi^2(3, N=22) = 10.364, p=.016$. This analysis⁶ shows that comments about report writing by engineering professors were statistically more frequent than comments from professors in other disciplines. The final comparison was for applying knowledge, $\chi^2(4, N=17) = 10.941, p=.027$. This result⁷ suggests that applying knowledge as a writing purpose may be more prominent in psychology than the other disciplines.

The Greatest Writing Challenges

The final research question addressed the various types of writing challenges that students encounter within the five fields examined in this study. Professors responded to the open-ended prompt, What are the greatest writing challenges your students face? Three researchers carefully analyzed these responses and identified common⁸ themes. Unlike the writing purposes, there were no statistically significant differences across disciplines in the frequency with which these challenges were mentioned. Table 7 presents the 17 themes that were identified along with percentages and frequency counts indicated parenthetically. Since no differences were identified across discipline, the information is presented in a single column.

⁵ Biology $R=2.731$, psychology $R=1.125$, business $R=-.884$, engineering $R=-.884$, computer science $R=-2.088$).

⁶ Engineering $R=2.345$, psychology $R=1.492$, biology $R=.640$, business $R=-1.492$, no cases for computer science.

⁷ Psychology $R=2.495$, engineering $R=1.302$, business $R=.868$, computer science $R=-.759$, biology $R=-1.302$).

⁸ Though most descriptors used in Table 7 were drawn from the respondents' own language, some were chosen by the researchers to represent a concise, overarching theme, such as the term genre.

Table 7. Overall Writing Challenges

Theme References (N=17)	Total
Genre	15.53%(32)
Clarity	10.19%(21)
Grammar	10.19%(21)
Organization	8.25%(17)
Concise	7.28%(15)
ESL	7.28%(15)
Basic writing	6.80%(14)
Critical thinking	6.31%(13)
Mechanics	5.34%(11)
Vocabulary	4.37%(9)
Writing process	3.40%(7)
Relevance	2.91%(6)
Synthesize	2.91%(6)
Understanding content	2.91%(6)
Citation/paraphrase	2.43%(5)
Time	1.94%(4)
Motivation	1.94%(4)
Total	100%(206)

The most frequently mentioned challenge was associated with the genre of the respective disciplines. Earlier we defined genre as “the specific patterns and structure of the writing in the discipline.” It might also include the appropriate use of discipline-specific vocabulary or, defined more broadly, any number of features associated with academic writing. One psychology professor used the following description regarding student difficulty with genre:

They seem to struggle with the scientific genre. Many seem to have learned in high school to use big words whenever possible in ways that can really confuse both them and their reader. I find I have to work hard to convince them that their goal in scientific writing is to educate and convince their audience; not to impress. This clarity and directness is challenging for them.

Other professors expressed similar concerns. For example, several biology professors lamented that their students lacked the ability to utilize “scientific language” or a “scientific writing style,” as opposed to a “conversational tone” and that they struggled to effectively “show scientific reasoning” or appropriate “sci-

entific arguments.” Similarly, one psychology professor described what was termed “practicing voice” so students could “sound like a psychologist.”

Other recurring challenges include problems with clarity, troubles with grammar, difficulties with organization, a lack of concision, and a variety of other challenges associated with language, critical thinking, mechanics, and so on. Just a few observations may be instructive. For example, a biology professor lamented the following about clarity in his student writing

[S]ome write as stream of consciousness, in a hurry to get enough words out to fill the page limit. They don't appear to consider writing to be a way to clarify thoughts, but as a form of painting and the goal is to fill the page.

In addition, an engineering professor shared the following about the importance of accuracy:

Just today, I chose not to interview a candidate for a summer internship position at the company I currently work for because the email this candidate sent me revealed a significant weakness in both expression and grammar, and that skill is very important to the engineering research work I am looking to have the summer intern work on.

Discussion

This study addressed a number of research questions based on the perceptions of professors teaching students in the first semester of study within five of the most common disciplines for ESL learners in the United States.

One overarching question driving this study is whether a generic approach to writing instruction may be appropriate for English language learners who are transitioning into a university where English is the medium of instruction. Results showed differences in the volume and types of writing across the fields examined in this study. On average biology and psychology professors required more writing than their counterparts in business and computer science. These findings of different volumes and types of writing across disciplines seem consistent with previous research (e.g., Garbati et al., 2015; Graves, 2010; Moran, 2013), though this study adds additional disciplines that have not previously been studied carefully.

For research writing, biology students produced an average of more than six times the writing produced by the computer science students or just over 25 more pages during the course. Psychology students produced an average of nearly 20 more pages of research writing than the computer science students. The differences across disciplines shown in this study seem striking. Another noticeable finding had to do with research writing. While many scholars identified research writing as the most common type of writing assignment (e.g., Graves et al., 2010, Horowitz, 1986), the pages of research writing in this study trailed behind other types of writing across each of the disciplines. Furthermore, only a few of the respondents mentioned the importance of research writing in terms of one of the purposes for writing within the course. This lack of emphasis on research writing could be related to the fact that this study focused exclusively on students who were just starting their study within specific fields, or it might be due to the different data collection methods used across studies.

This discrepancy regarding research writing could also be related to something much more deeply entrenched in the respective fields that make it difficult to communicate effectively about what is meant by the notion of research writing. For example, Melzer (2009) claimed:

the difference among disciplines—and even instructors within the same discipline and subdiscipline—in terms of the purposes and audiences for research writing, research methods, what counts as evidence, how research papers are structured, and the persona the writer is asked to take on make it difficult to generalize about the research paper (Melzer, 2009, p. 255).

With such uncertainty, the importance and prevalence of research-based writing at the beginning of study within a specific discipline may be worth additional examination.

For non-research based writing, biology students produced 4.7 times more writing compared to computer science students or just over 36 more pages during the course. Since these differences are fairly dramatic, it seems that students intending to study fields such as biology and psychology would benefit from extensive instruction and practice that will prepare them well for producing quality writing at higher volumes.

The discipline also seems to impact the volume of writing that may be handwritten. Handwriting is much less common in computer science and psychology though perhaps for different reasons. While handwriting in psychology may be inconsistent with the professional standard of writing expected for most types of assignments, for computer science, it might simply be a matter of inconvenience for students or professors to deal with hard copies when so much of their work takes place in a digital environment. On the other hand, the fact that nearly three fourths of the writing in engineering is allowed to be handwritten may also be a reflection of the specific types of writing done within the field. For example, much of the writing done in engineering is infused with detailed calculations and mathematical solutions to problems. Such writing is done easily by hand but becomes much more cumbersome in an electronic format. While many programs that prepare ESL students for university study have planned or plan to move to paperless submissions of student work, it may be beneficial to continue to allow at least some handwritten work for students who plan to study engineering.

At the same time, it seems that students in all fields can expect to do a substantial amount of *short answer* writing on exams. Whereas Melzer (2009) seemed surprised that 21% of all writing in his study was assessment-based short responses, respondents in this study reported that more than a third of exam writing is short answer regardless of the field. In discussing short answer writing, however, Melzer (2009, p. 256) laments that “it is unfortunately the genre with the least social context that predominates.” Despite special challenges associated with helping students to write short answers well, this finding carries important implications. In addition to the rhetorical and grammatical features needed to produce quality writing in paragraphs or essays, students may benefit from explicit instruction on how to effectively present phrases or clauses that under other circumstances may not be considered grammatically well formed, complete, or appropriate by themselves. The accurate spelling of crucial terms may also become more important than it may be within larger pieces of writing that provide the reader with more context.

There are additional areas in which a specific discipline seemed to influence the relative importance of other aspects of writing. Though no differences were observed for discipline-specific vocabulary and genre, differences across the fields were observed for word choice, linguistic accuracy, and academic vocabulary. Word choice or the accurate use of vocabulary needed to convey meaning with

precision was more important in business than engineering or computer science. Similarly, academic vocabulary (as opposed to words that are more colloquial) was more important in biology and business than in computer science, and linguistic accuracy (e.g., grammar, mechanics such as spelling, punctuation and so on) was more important in psychology and business than computer science. These findings suggest that professors within specific fields may have different expectations regarding certain aspects of writing within the discipline.

There are some additional observations worth discussing regarding these various aspects of writing. Although there were no significant differences across the respective fields in terms of the relative importance of discipline-specific vocabulary or genre, on average, the professors who participated in this study suggested that discipline-specific vocabulary was *important* in their courses while genre was merely considered *somewhat important* ($d=.85$) This observation about genre—defined as the specific patterns and structure of the writing in the discipline—may seem unexpected since one might suppose genre to be more important in discipline specific writing. One explanation could be associated with what Moran (2013, p. 84) described as expectations for “discipline-oriented” writing that go “beyond the instructor’s awareness.” She described some professors whose frustrations with their student writing arose from an absence of certain genre-related features though they claimed such discipline specific features were not needed in the course. While discipline-specific vocabulary could be considered a component of genre, it is possible, that genre as defined here may not be as important as other aspects of writing.

For example, one explanation for the lower valuation of genre in their introductory courses may be that the purpose of writing within these disciplines during the first semester of study has much more to do with mastery of the basic concepts within the discipline than actually learning the skills needed to write like a professional within these respective fields. This assumption seems consistent with observations regarding writing purposes and the way professors manage student feedback. Some of the most frequent writing purposes include demonstrating knowledge, synthesizing knowledge, and reinforcing learning. Such purposes seem to suggest that writing at this level focuses on student mastery of basic concepts and the professor’s ability to use writing to assess that mastery. Thus, these purposes seem primarily focused on *assessing content through writing* rather than simply *assessing writing* or *assessing language through writing* as described by

Weigle (2013). These findings could have important implications for TESOL professionals as they teach their students how to use writing to effectively demonstrate and synthesize knowledge.

These findings seem to suggest that much of this writing seems more summative than formative. For example, findings from this study suggest that 20% of the respondents provide no feedback for student writing and that a third of the writing overall receives no feedback from professors. Only 20% of the student writing examined in this study may be resubmitted during the course, an amount somewhat larger than the nearly 13% reported by Melzer (2009). If writing development for students takes place incrementally over the course of a student's entire tenure at the university, as Haswell (1991) has claimed, then it may be beneficial for universities, departments, and faculty to consider ways to provide more writing instruction and feedback along the way. One way to increase feedback may be through the use of more nested writing assignments where students submit incremental drafts and receive useful feedback throughout the writing process (e.g., Garbati et al. 2015; Graves et al. 2019; Melzer, 2009).

The final research question in this study addressed writing challenges. Since there were no differences across the disciplines, these findings may be equally applicable to students studying in any field. Interestingly, the most frequent response related to student struggles was labeled "genre" by the researchers. One reason this seems problematic is the fact that genre was indicated by the respondents as the least important of the six aspects of writing. Although technically these results address different questions, the responses seem inconsistent. One reason for this result could be that while professors generally feel that genre only has marginal importance, they note that it is one of the students' greatest struggles. Another possibility is that professors appropriately recognize student writing challenges but that they do not ascribe these difficulties to problems associated with the genre-based features of the writing within the field.

Taken together, the findings of this study should be useful for curriculum developers, program administrators, and practitioners who teach writing to students who plan to study at universities in the United States. Some of these results provide insights that seem applicable to all students regardless of discipline. Other findings suggest the possible benefits of tailoring writing instruction to meet the unique needs of learners within specific fields.

An example of how these findings might inform curriculum and pedagogy is drawn from our past teaching experience at one of the institutions surveyed for this study. The university is a BA granting institution where approximately 45% of the students are ESL learners. This school has an intensive English program that helps students prepare for their discipline-specific studies before being fully matriculated into the university. Nearly 60% of these ESL students go on to study business. Data gleaned from this study about features unique to business students such as short answers, multi-paragraph, and analysis writing tasks, could be incorporated into the IEP writing curriculum to better prepare students bound for business degrees.

Similar findings can also be gleaned to inform curriculum developers and writing teachers for the other fields being studied. Students planning to study psychology can expect to encounter much multi-page as well as short answer writing much of it genre specific and most of which will need to be linguistically accurate. Students planning to study engineering in the future can expect that many of their writing experiences will be done by hand, short answers will be quite common, and linguistic accuracy and discipline specific vocabulary will be likely expectations. Similar to psychology, students studying biology will demand much linguistically accurate, multi-page (36 pages per semester) and short answer writing. Students planning to study computer science can generally expect to do much less writing than in other disciplines. However, the writing they can expect will generally be short answer or paragraph in length and will need to be lexically and linguistically accurate. In addition, students bound for any of these disciplines might be informed of the challenges that genre, clarity, and grammar will present as they move toward their selected fields of study.

Limitations and Future Research

Although this research provides many useful insights about writing within the first semester of study within five popular disciplines for ESL students, there are a number of limitations that should be considered. First, this study intentionally limited its examination of writing to first-semester courses within five common fields. No attempt was made to examine writing courses outside of these disciplines such as courses associated with general education requirements. In future research, it could be helpful to identify the writing purposes, expectations, and challenges

raised by those who teach required writing courses that are not part of study within a specific discipline to determine how well they align with the views of the professors within the disciplines examined in this study. Moreover, data from this study was gleaned from a single survey without follow-up interviews. Additional interviews in future study could help clarify responses and strengthen results.

Future research could also examine additional disciplines beyond those analyzed in this study and could pose similar questions of professors toward the end of the student's baccalaureate experience. This could help determine whether perceptions of writing expectations, purposes, and challenges remain constant or whether meaningful differences emerge over time. This study has highlighted a number of areas where writing expectations, purposes, and challenges varied depending on the discipline. Such findings could suggest that discipline-specific writing instruction could be more helpful to learners than generic approaches. Future research should examine the efficacy of such approaches empirically.

Conclusion

This study examined a number of research questions associated with the perceptions of professors in the first semester of study within five of the most common disciplines for ELLs in the United States. Our findings seem consistent with the observation of Downs and Wardle (2007, p. 558), "writing is neither basic nor universal but content- and context-contingent and irreducibly complex." The results produced a variety of insights that may help writing teachers regardless of the student's chosen field. They also provided a variety of data suggesting that a one-size-fits-all approach to writing instruction may not be the most effective way to prepare ESL learners who plan to study at universities in the United States. While specialized writing instruction designed specifically for students within certain fields may not always be feasible or necessary, such an approach may be more effective. Where contexts may allow, we encourage program administrators and practitioners to explore the possibility of tailoring writing instruction to meet the unique needs of individual learners.

References

Chow, P., & Bhandari, R. (2011). *Open doors: Report on international educational exchange*. New York, NY: Institute of International Education.

- Downs, D. and Wardle, E. (2007). Teaching about writing, righting misconceptions: (re)envisioning ‘first-year composition’ as ‘introduction to writing studies.’” *College Composition and Communication* 58(4), 552–84.
- Ferris, D. (2015). Supporting multilingual writers through the challenges of academic literacy: Principles of English for academic purposes and composition instruction. In N. W. Evans, N. J. Anderson, & W. G. Eggington (Eds.), *ESL readers and writers in higher education: Understanding challenges, providing support* (pp. 147–163). New York, NY: Routledge.
- Garbati, J., McDonald, K., Meaning, L., Samuels, B., & Scurr, C. (2015). *Writing assignments and instruction at Ontario’s publicly funded universities: A view from three disciplines*. Toronto: Higher Education Quality Council of Ontario.
- Gardner, S., & Nesi, H. (2012). A classification of genre families in university student writing. *Applied Linguistics*, 34, 25-52.
- Graves, R., Hyland, T., & Samuels, B. M. (2010). Undergraduate writing assignments: An analysis of syllabi at one Canadian college. *Written Communication*, 27(3), 293-317.
- Hardy, J. A., & Friginal, E. (2016). Genre variation in student writing: A multi-dimensional analysis. *Journal of English for Academic Purposes*, 22, 119-131.
- Haswell, R. (1991). *Gaining ground in college writing: Tales of development and interpretation*. Dallas, TX: Southern Methodist University Press.
- Horowitz, D. (1986). Process, not product: Less than meets the eye (in The Forum). *TESOL Quarterly*, 20, 141-144.
- Johns, A. M. (1981). Necessary English: A faculty survey. *TESOL Quarterly*, 15, 51-57.
- Kaufman, C. (2010). *The Writers guide to Psychology: How to write accurately about psychological disorders, clinical treatment and human behavior*. Fresno, California: Quill Driver Books.
- Leki, I. (2007). *Undergraduates in a second language: Challenges and complexities of academic literacy development*. New York: Lawrence Erlbaum.
- Melzer, D. (2009). Writing assignments across the curriculum: A national study of college writing. *College Composition and Communication*, 61(2), W240.
- Moran, K. E. (2013). *Exploring undergraduate disciplinary writing: Expectations and evidence in psychology and chemistry* (Unpublished doctoral dissertation). Georgia State University, Atlanta, Georgia.

- Pell Institute for the Study of Opportunity in Higher Education. (2017). Evaluation toolkit. Retrieved from <http://toolkit.pellinstitute.org/evaluation-guide/analyze/analyze-qualitative-data/>
- Perin, D. (2013). Literacy skills among academically underprepared students. *Community College Review*, 41, 118-136.
- Qualtrics, L. L. C. (2015). Qualtrics survey platform. Provo, UT, USA.
- Robinson, M. S., Stoller, F. L., Costanza-Robinson, M. S., & Jones, J. K. (2008). *Write like a chemist: A guide and resource*. Oxford: Oxford University.
- Soter, H. A & Smith, S. J. (2016, March). Beyond composition: Teaching students how to transition from composition classes to the business writing classes, Student Success in Writing Conference, Savannah, Georgia. Retrieved from <http://digitalcommons.georgiasouthern.edu/sswc/2016/2016/6>
- Stoller F. & Robinson M. (2015). Assisting ESP students in reading and writing disciplinary genres. In N. W. Evans, N. J. Anderson, & W. G. Eggington (Eds.), *ESL readers and writers in higher education: Understanding challenges, providing support* (pp. 164 –179). New York, NY: Routledge.
- Taylor-Powell, E., & Renner, M. (2003). *Analyzing qualitative data*. University of Wisconsin-Extension, Madison, WI. Retrieved from <http://learningstore.uwex.edu/Assets/pdfs/G3658-12.pdf>
- Weigle, S. C. (2013). English as a second language writing and automated essay evaluation. In M. D. Shermin & J. C. Burstein (Eds.), *Handbook of automated essay evaluation: Current applications and new directions* (pp. 36-54). New York: Routledge.
- Winsor, D. A. (2013). *Writing like an engineer: A rhetorical education*. New York: Routledge.

About the Authors

K. James Hartshorn has been involved in second language education in the United States and Asia for three decades. James currently serves as Program Coordinator of BYU-Provo's English Language Center where his professional interests include teacher development and second language acquisition with an emphasis on second language writing.

Norman W. Evans is a professor and the Department Chair in the Linguistics Department at Brigham Young University. His research focuses on writing in a second language, language teaching methods, and curriculum development.

Appendix A

This survey will focus on one introductory, undergraduate course.

Course:

Please limit your responses to this course.

How important are the following language skills for student success in your course?

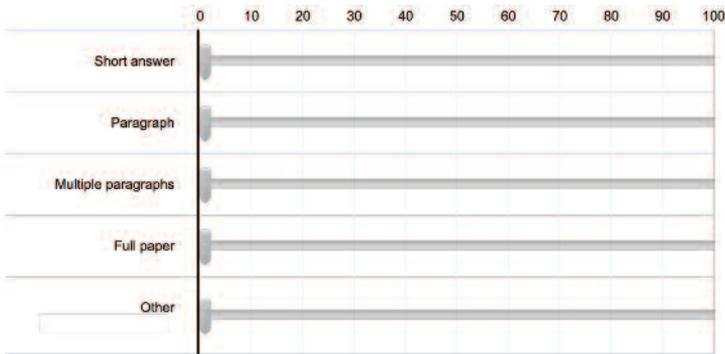
	Not important	Somewhat important	Important	Very important
Reading	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speaking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicated the kinds of writing done in your course and the importance of each.

	Research				Approximate number of pages for the course
	Not part of course	Somewhat important	Important	Very important	
Library research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Review of Literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Laboratory research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Field research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Research proposals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

	Other types of writing				Approximate number of pages for the course
	Not part of course	Somewhat important	Important	Very important	
Summary/Synopsis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Technical writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Journal (e.g., reflection/reaction)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Email/chat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Math problem solving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

To help us understand the importance of writing on your exams, please consider your typical exam and indicate the approximate percentage of your entire exam that is made up of the each of the following types of writing:



What are the main purposes of writing in your course? (e.g., demonstrate knowledge, report information, synthesize ideas, argue or persuade, reinforce learning)

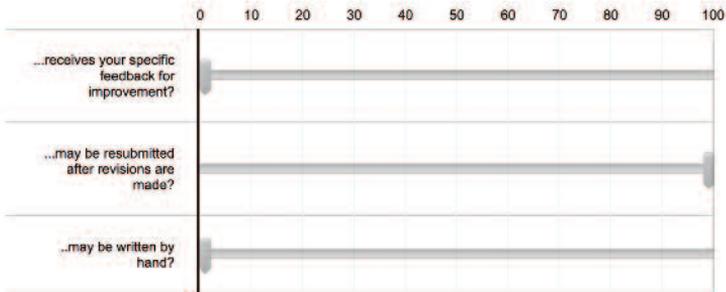
What are the greatest writing challenges your students face?

How important are each of the following in the writing of your students?

	Not important	Somewhat Important	Important	Very important
The Genre (i.e., the specific patterns and structure of the writing in the discipline)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Word Choice (Writers use vocabulary accurately to convey meaning with precision)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academic-level Vocabulary (words are academic and less colloquial or conversational)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discipline-specific Vocabulary (Students use the specific vocabulary of the discipline)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Linguistic Accuracy (i.e., grammar, mechanics such as spelling, punctuation and so on)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Drag the lever to display the most appropriate percentage to complete the statements.

Approximately what percentage of the writing your students submit...



Submit