PERCEPTIONS OF COMMUNICATION TRAINING AMONG COLLEGIATE AVIATION FLIGHT EDUCATORS

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ABSTRACT

This paper reports on the opinions of educators regarding communication training in University Aviation Association (UAA) member collegiate aviation flight programs. Educators representing 37 UAA member flight programs indicated their levels of agreement with a battery of statements regarding communication training on a five-point Likert scale. Chi square and Mann-Whitney analysis of responses indicates that these educators agree on the importance of communication skills, the purpose of written assignments, and their institution's preparation of students to communicate effectively in industry. Opinions are more varied regarding the integration of more communication assignments and the willingness of institutions to compensate those instructors who choose to incorporate such assignments.

INTRODUCTION

The idea that pilots need to be able to communicate well is not a new one. Attempts to develop international air traffic control (ATC) rules addressing language and pilots' needs to communicate date back to 1922 (Orlando, n.d.). Current Federal Aviation Regulations require pilot certificate applicants to read, speak, write, and understand English (Certification: Pilots & Instructors, 2000). Lintner and Buckles (1992) note the obvious—that "the [ATC] system cannot work unless pilots and controllers can communicate effectively and understand each other" (p. 254). To underscore the statement, they note that approximately 254 of 872 operational errors (violations of aircraft separation minima) occurring in 1990 "involved some type of communication deficiency" (Lintner & Buckles, p. 254). Writing skills may not be required during the most critical phases of a pilot's job, but they are important at other times; oral

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communication skills are a must, and computer literacy as related to flight automation is becoming more and more important. Additionally, air traffic controllers, aircraft maintenance technicians, line service personnel, dispatchers, flight attendants, gate agents, and others must be able to clearly convey pertinent information to the appropriate people at the appropriate time. Ultimately, the safety of every flight relies on effective communication between all parties involved with that flight.

One recent study has shown that aviation leaders noted "significant deficiencies in the aviation community in the ability to communicate and recommended basic writing and verbal skills including grammar, spelling, punctuation, and speaking be incorporated into the curriculum" (Kutz, 2000, p. 24). Ragan (1997) points out that "[e]ven native English-speaking students—especially American students coming out of high schools less prepared verbally and mathematically for the challenges of any academic pursuit—need some sort of support to help them become more proficient with language" (p. 33). For pilots and controllers in particular, the choice of words can greatly affect a flight outcome.

"If someone talks in a way that does not fit with our idea of how a credible speaker should talk, we're less likely to pay attention to what that person has to say," says Bruce E. Gronbeck, a professor of communication studies at the University of Iowa. Teaching students different dialects to suit different situations is what experts call 'code switching.' Without it, students might get typecast as ditzy or dumb. (Schneider, 1999, p. A16-18)

Without a good working knowledge of standard aviation phraseology, sounding ditzy or dumb can be the least of a pilot's worries. Aircraft accident reports such as Avianca Flight 052 (National Transportation Safety Board, 1990) and United Flight 2860 (National Transportation Safety Board, 1978) indicate a need for clear communication.

Educators approach communication training in a variety of ways. University Aviation Association (UAA) member collegiate aviation flight programs employ a number of ways to work communication training and assignments utilizing communication skills into the curriculum (Ruiz, 2003). This paper reports on the perceptions that aviation flight educators hold regarding communication training and the use of assignments utilizing communication skills. It also reports on the opinions that respondents whose institutions employ a Writing across the Curriculum (WAC) program hold of WAC.

PERCEPTIONS OF COMMUNICATION ASSIGNMENTS

A review of literature regarding views of assignments that utilize communication skills shows that perceptions vary widely among students and educators alike, and not just in aviation. Munter (1999) sums up the

concerns that many students and educators have. Discussing writing assignments, and WAC specifically, she notes that the incorporation of such assignments into different courses can be problematic because: a) the writing assignments are not representative of the writing that will be expected in industry; b) faculty are not properly trained to teach writing; and c) the time spent on properly developing student writing skills is inadequate. Similar arguments are made for speaking and other communication skills (Morello, 2000; Schneider, 1999).

Student Perceptions

Students often balk at the prospect of having to write a term paper, and that may be justifiable. Assignments need to mirror the types of communication they can realistically expect to encounter. Few of them will be required as professional pilots to write a seven to ten page report on the development of GPS or the pros and cons of Free Flight. Too many times, these become exercises in parroting information and using the cut and paste function on the computer. While such an assignment may increase a student's knowledge base for a particular subject, it does not necessarily improve communication skills.

In a study designed to gauge students' and teachers' perceptions of the effects of writing assignments on students' writing ability and learning, students surveyed indicated that while the writing assignments generally improved both their overall writing skills and their learning of course content, the benefit to writing skills was not as great as the benefit to knowledge levels (Beason & Darrow, 1997). The researchers noted that students believed the assignments helped them understand course concepts, retain and recall information, and introduced them to professional publications that would be beneficial to them in their future careers. However, some of the same students indicated in post-survey interviews that the benefits were not as great as they would have liked due partly to a perceived lack of feedback.

Other researchers report similarly positive feedback from students. Lutte (1996) notes that "students accepted and enjoyed the case analysis course . . . [and] . . . indicated they improved in areas such as communication and comprehension and retention of complicated concepts" (p. 18). Garner (1994) learned via an open-ended class evaluation that 80% of 100 students believed that microtheme assignments-short (150-200 word) written expositions designed to foster more critical thinking-should be continued in accounting classes.

Faculty perceptions

Instructors may balk at the prospect of having to play grammar teacher and the idea of more work to be graded. Young and Fulwiler (1986) note that the incorporation of writing assignments into more courses places "some responsibility for assigning and evaluating with every teacher" (p. 1). However, the resources required for the evaluation may not be available. Kalmbach and Gorman (1986) noted in their 1982 survey that faculty objections against the implementation of a WAC program included a lack of institutional support, lack of time, large class sizes, and course content not compatible with writing.

Additionally, some instructors in the fields of written and oral communication do not support the across the curriculum movements that have been gaining ground since the 1970s. The feeling is that instructors in other fields are not qualified to teach writing and speaking skills (Morello, 2000, Schneider, 1999). Of course, the instructors in other fields argue that they are not teaching, for example, speaking skills per se; they are using speaking as a medium through which students learn and, incidentally, improve their speaking skills (Schneider, 1999).

For those concerned about the proper assessment of assignments, the literature addresses several concerns. Riley (1996) points out that, in his experience, marking up a paper for common writing mistakes seldom restrains a student's motivation or creativity. Gribbin (1991), in discussing graded versus ungraded writing assignments, notes that while improper usage and spelling may undermine the credibility of a product, the main thrust of the evaluation should not be on the mechanics (grammar, spelling, and punctuation), but on the overall product and the thinking and learning behind it. The implication is that the mechanics of writing are not ignored, but that in some assignments they are only a small part of the grade. In the end, the instructor must determine whether the assessment will focus more on content or communication skills, and then convey that to the student.

While these are issues that must be addressed, educators do recognize that such assignments hold benefits for students. For example, in a national study of journalism and mass communication faculty, Panici and McKee (1997) report that respondents indicate that WAC courses help students by fostering critical thinking, promoting better analysis and synthesis of information, encouraging precision in written work, and reinforcing learning.

RESEARCH QUESTIONS

For this paper, the researcher wished to determine the opinions of aviation educators regarding communication training and assignments utilizing communication skills in a UAA member collegiate aviation flight program. The research questions to be answered included:

1. As perceived by collegiate aviation educators, of what importance are communication skills—in particular oral, written, electronic, and visual communication skills—to students graduating from a program preparing them for a career in aviation?
2. What are aviation educators' opinions of their institution's ability to adequately prepare students to communicate effectively in the aviation industry?
3. What are aviation educators' perceptions of the purpose of written assignments for aviation students?
4. To what extent are aviation educators receptive to the integration of more communication assignments in their courses?
5. What are aviation educators' perceptions of their institutions' willingness to facilitate the implementation of more communication assignments?
6. What are the perceptions of aviation educators regarding the benefits of WAC in collegiate aviation?

METHODOLOGY

To answer these research questions, a population was identified using the 2001-2002 UAA Institutional Members list. Of 119 total institutions, the 115 institutions located in the United States and its territories were chosen for this study.

A cover letter, four-page survey, and postage-paid, return envelope were sent to each institution's contact person. The three-part survey requested basic demographic information, general information related to existing communication training within aviation programs, and WAC-specific information. The surveys were printed on green paper, as King, Pealer and Bernard (2001) note some studies that suggest that this can increase response rates. Four weeks after the initial mailing, follow-up letters were sent to all of the institutions.

To check the validity of the survey instrument, it was distributed to two experts for their review. The survey was also given to four colleagues who teach or have taught ground school courses in a flight training program to test the instrument for reliability.

RESULTS

Of the 115 institutions contacted, 37 (32%) returned completed surveys. This low response rate can only partially be attributed to the fact that not all UAA-member institutions offer aviation flight training. A review of the Collegiate Aviation Guide (CAG; Kitely, 1999) and supplementary web searches yielded the following information. Of the surveyed institutions, 92

offer some level of flight training, and 22 do not. The researcher was unable to determine program offerings of the one remaining institution. This yields a response rate of 40% for surveyed institutions known to offer flight training.

While Babbie (1992) suggests a 50% response rate is recommended for mail surveys sampling a population, he admits that this is only a guide. This particular study attempted to survey the entire population and not a sample. To determine the possibility of response bias, analysis of various characteristics of the responding institutions was attempted utilizing information gleaned from the CAG, the World Wide Web, and demographic information reported by respondents. Due to incomplete information reported in the CAG and the changing membership in the UAA, it was difficult to exactly match the surveyed population. Only 62 of the surveyed institutions, that were UAA members in 2001-2002, had information reported in the 1999 CAG, and the information given on these institutions was not necessarily complete. Therefore, internal analysis for response bias was not completed.

Statistics used to interpret the data include descriptive statistics (frequency counts, means, and standard deviations), the Pearson Chi-square, and the Mann-Whitney U. An alpha level of 0.05 was used to determine significance in statistical tests.

Demographics

The 37 respondents were either department chairpersons (25) or senior faculty members (12) at their institutions. One had earned an Associate degree, six a Bachelor's degree, seventeen a Master's degree, eleven a Doctorate degree, and one indicated Specialist. One respondent did not indicate an education level. They averaged eight years in their current position, with 16 employed five years or less, 11 from six to ten years, 4 from eleven to fifteen years, 2 from sixteen to twenty years, and 4 with more than twenty years in the current position.

Institutions represented both two-year colleges (17) and four-year universities (21). One respondent indicated both. Overall student enrollments reported by the institutions range from 100 students to 55,000 students, and flight training enrollments range from 10 students to 300 students. Associate degrees in aviation are offered by 18 of the institutions, 21 institutions offer a Bachelor's degree, 6 offer a Master's degree and 1 reported offering a Doctorate degree. Respondents were asked to indicate the number of single-engine aircraft, multi-engine aircraft, flight training devices (FTDs)/simulators, and personal computer advanced training devices (PCATDs) their institutions operate. Eighteen respondents (49%) indicated the actual number while the remainder checked which types of equipment

were available. Therefore, only the number of respondents indicating the use of a certain type of equipment is reported here. Equipment utilized in flight training by the responding institutions include single-engine aircraft (32 institutions), multi-engine aircraft (27 institutions), FTD/simulators (33 institutions), PCATDs (22 institutions), and one respondent reported none of the above.

Perceptions of importance of communication skills

The survey asked respondents to rate the importance of certain communication skills—oral, written, electronic, and visual communication—to students entering an aviation career upon graduation from an aviation-related program. Respondents rated each of the four communication skills using a Likert scale, with 5 meaning very important for students to have upon graduating from a program preparing them for a career in aviation to 1 meaning not at all important. Table 1 presents descriptive statistics derived from the responses received. Additionally, respondents were asked to indicate their level of agreement or disagreement with a listing of 14 statements written to gather perceptions of communication training and assignments incorporating specific communication skills. These 14 statements are included in Appendix A. The first two of these statements relate to the importance of communication skills. A five-point Likert rating scale was used (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree).

Perceptions of communication training

The remaining 12 statements included in Appendix A elicited respondents' perceptions of communication training and written assignments at their institutions. Descriptive statistics on the responses are shown in Table 2.

Table 1. Perceived importance of four types of communication skills, by University Aviation Association members, 2003

	N	*Minimum Value*	*Maximum Value*	*M*	*SD*
Oral Communication	37	2	5	4.70	0.66
Written Communication	37	1	5	4.32	0.91
Electronic Communication	37	3	5	4.07	0.74
Visual Communication	37	2	5	4.05	0.81

Table 2. Responses to statements about communication training and assignments incorporating specific communication skills, by University Aviation Association members, 2003

	N	*Mini-mum Value*	*Maxi-mum Value*	*M*	*SD*
Communication skills are important in the aviation industry.	37	4	5	4.83	0.37
Developing good communication skills goes hand-in-hand with developing the critical thinking skills necessary in the aviation industry.	37	2	5	4.56	0.64
Students entering my institution's aviation program already possess the communication skills necessary for an aviation career.	37	1	4	2.10	0.80
Students graduating from my institution's aviation program possess the communication skills necessary for an aviation career.	37	2	5	3.89	0.69
My institution's general education coursework prepares students to communicate effectively in the industry.	37	2	5	3.45	0.80
My institution's aviation program prepares students to communicate effectively in the industry.	37	2	5	3.94	0.66
The purpose of writing assignments within my institution's aviation programs is to enhance the student's knowledge of course material (writing-to-learn).	37	2	5	4.00	0.66
The purpose of writing assignments within my institution's aviation programs is to enhance the student's ability to communicate effectively through writing (learning-to-write).	37	2	5	3.97	0.68
My institution's aviation program(s) could do better at preparing students to communicate effectively in industry.	37	2	4	4.05	0.70
Instructors at my institution incorporate adequate communication assignments into their courses to prepare students for an aviation career.	37	1	5	3.43	0.89
Incorporating more writing/speaking assignments into my institution's aviation programs would limit the amount of aviation material instructors could cover in each course.	37	1	5	3.17	1.19

Table 2. Responses to statements about communication training and assignments incorporating specific communication skills, by University Aviation Association members, 2003 (continued)

	N	*Mini-mum Value*	*Maxi-mum Value*	*M*	*SD*
Instructors at my institution would be willing to incorporate more written, oral, electronic, and/or visual communication assignments into existing curricula to enhance students' communication skills.	37	2	5	3.54	0.80
Communication skills should be taught by English and speech teachers, not aviation faculty.	36	1	5	2.47	1.08
My institution would consider some additional benefit/incentive for instructors who incorporate more communication assignments into their courses.	37	1	5	2.81	1.17

Perceptions of Writing across the Curriculum

Respondents were asked to indicate whether their institution offers a WAC program. Those respondents reporting a WAC program responded to a question regarding perceived benefits that the institution's WAC program holds for students' communication skills. A list of these benefits is included in Appendix B. Respondents were asked to rate each of the perceived benefits using a Likert-type rating scale (5 = a very noticeable benefit, 4 = a moderate benefit, 3 = some benefit, 2 = very little benefit, and 1 = no benefit). Statistics on the responses are included in Table 3. Additionally, respondents were asked to indicate whether the institution's WAC program benefits students' communication skills, and if evidence of the benefit exists, whether it is anecdotal or quantitative.

DISCUSSION

Research Question 1

The first research question asked the following: As perceived by aviation educators, of what importance are communication skills—in particular oral, written, electronic, and visual communication skills—to students graduating from a program preparing them for a career in aviation.

Overall, respondents strongly agree (M = 4.84, SD = 0.37) with the statement that communication skills are important in the aviation industry. Educators rated all of the four communication skills presented—oral, written, electronic, and visual—as important communication skills to have upon graduating from a program preparing students for a career in aviation (see Table 1). Respondents also strongly agree (M = 4.58, SD = 0.65) with

the statement that the development of communication skills is related to the development of critical thinking skills that students will need in the aviation industry.

Table 3. Perceived benefits of Writing across the Curriculum programs, by University Aviation Association members, 2003

	N	*Mini-mum Value*	*Maxi-mum Value*	*M*	*SD*
Improve mechanics of student writing	6	3	5	4.00	0.63
Improve student's oral communication	6	3	4	3.50	0.54
Improve student's computer literacy	6	3	4	3.67	0.51
Improve student's ability to express ideas clearly and convey messages accurately	6	4	5	4.17	0.41
Improve student's logic/thought processes/problem solving skills	6	3	4	3.67	0.51
Enhance student's learning and understanding of course material	6	3	4	3.83	0.40
Other	2	5	5	5.00	0.00

Of the four specific communication skills addressed, oral communication skills received the highest rating (M = 4.70). With a standard deviation of 0.66, it appears that educators generally agree that oral communication skills are very important. It should be noted that twenty-nine respondents rated oral communication skills as a 5 on the Likert scale; of the remaining eight respondents, six rated these skills as a 4, one as a 3, and one as a 2.

The remaining three communication skills—written, electronic, and visual—were generally rated as important skills for students to have, with mean scores of 4.32, 4.07, and 4.05, respectively. All had a standard deviation of less than 1.00, showing general agreement among the respondents; inspection of the data shows a spread for these skills that is not as strongly skewed to the right as for oral communication skills (see Table 4).

Chi-square analysis of the data shows a statistically significant difference between perceptions of department chairpersons and senior faculty members for written and visual communication (see Table 5). However, due to limitations associated with the Chi-square test, a further analysis was performed. Mann-Whitney analysis shows the differences to be significant for oral, written, and visual communication. In all three of these cases, department chairpersons rated the skills as more important than the

senior faculty members did, and lower standard deviations show better agreement among the department chairpersons (see Table 6). No significant differences were noted for type of institutional affiliation or WAC program status (see Table 5).

Table 4. Number of responses reflecting perceived importance of four communication skills, by University Aviation Association members, 2003

	Likert Scale Ranking				
	1	*2*	*3*	*4*	*5*
Oral Communication	0	1	1	6	29
Written Communication	1	0	5	11	20
Electronic Communication	0	0	9	17	12
Visual Communication	0	1	8	16	12

Table 5. Results of Mann-Whitney analysis of perceived important of four types of communication, by University Aviation Association members, 2003

	*Respondent position***		*Institutional affiliation*		*WAC program status***	
	U	*p*	*U*	*p*	*U*	*p*
Oral Communication	102.5	0.03*	151.5	0.70	140.0	0.35
Written Communication	85.0	0.01*	126.0	0.23	143.0	0.53
Electronic Communication	97.5	0.06	155.5	0.87	121.5	0.18
Visual Communication	85.5	0.02	146.5	0.64	124.0	0.21

N = 36 for institutional affiliation.
**N = 37 for respondent position and Writing across the Curriculum (WAC) program status.
*$p < .05$

Research Question 2

The second research question asked the following: What are aviation educators' opinions of their institution's ability to adequately prepare students to communicate effectively in the aviation industry.

Respondents disagree (M = 2.10, SD = 0.80) with the statement that students entering their institution come equipped with the communication skills they will need to pursue a career in aviation. Overall, they do agree (M = 3.89, SD = 0.69) with the statement that they believe their program's graduates have the communication skills they will need. Respondents also

tend to agree more with the statement that their aviation program gives students the communication skills they will need (M = 3.94, SD = 0.66) than with the statement that the institution's general education coursework gives them the skills they need (M = 3.45, SD = 0.80). The respondents also agree (M = 4.05, SD = 0.70) with the statement that their program could improve in its preparation of students to communicate in industry. Chi-square and Mann-Whitney analysis of these statements shows a statistically significant difference based on the respondent's position in answers to statements about the institutions general education coursework and aviation program preparing students to communicate effectively in the industry (see Table 7). Department chairpersons agree (M = 3.72, SD = 0.73) that the general education coursework at their institutions prepare students to communicate in the industry, while senior faculty members neither agree nor disagree (M = 2.92, SD = 0.67). Additionally, department chairpersons agree (M = 4.16, SD =0 .55) that their aviation programs prepare students to communicate effectively, while senior faculty members approach agreement (M = 3.50, SD = 0.67). No statistically significant differences in responses to these two statements were noted based on institutional affiliation or WAC program status. No statistically significant differences based on respondent position, institutional affiliation, or WAC program status were detected in responses to the statements about: a) students entering programs already possessing the communication skills necessary; b) students graduating programs possessing the communication skills necessary; or c) programs doing better at preparing students to community effectively.

Research Question 3

The third research questions asked the following: What are aviation educators' perceptions of the purpose of written assignments for aviation students.

Respondents agree that the purpose of writing assignments within their aviation program is to enhance the student's knowledge of course material (M = 4.00, SD = 0.66) and enhance the student's ability to communicate effectively through writing (M = 3.97, SD = 0.68). No statistically significant differences were detected in responses to these statements based on respondent position, institutional affiliation or WAC program status.

Research Question 4

The fourth research question asked: To what extent are aviation educators receptive to the integration of more communication assignments in their courses.

A series of four statements sought to elicit respondents' perceptions of working more communication assignments into the curriculum. The results

show that respondents generally neither agree nor disagree with these statements.

Respondents neither agree nor disagree that instructors at their institution incorporate adequate communication assignments into their courses to prepare students for an aviation career (M = 3.43, SD = 0.89). Chi-square and Mann-Whitney analysis of responses to this statement shows statistically significant differences based on respondent position and WAC program status (see Table 7). Department chairpersons approach agreement (M = 3.64, SD = 0.91) with the statement, while senior faculty members neither agree nor disagree (M = 3.0, SD = 0.74). Additionally, respondents from institutions without an established WAC program neither agree nor disagree (M = 3.09, SD = 0.95). Those reporting either an established or developing WAC program agree (M = 4.00, SD = 0.39) with the statement. A further breakdown of the data shows that while respondents from institutions that are developing a WAC program agree (M = 3.75, SD = 0.50), those from institutions with an established WAC program also agree more strongly (M = 4.1, SD = 0.32).

Respondents neither agree nor disagree with the idea that incorporating more writing or speaking assignments into the aviation program would limit the amount of aviation material instructors could cover in each course (M = 3.17, SD = 1.19). The higher standard deviation here reflects a wider range of opinions expressed overall on this statement than on any other statement. Mann-Whitney analysis shows that differences in responses to this statement based on institutional affiliation and WAC program status are significant (see Table 7). Respondents from two-year institutions approach agreement (M = 3.62, SD = 0.88) with the statement, while respondents from four-year institutions neither agree nor disagree (M = 2.70, SD = 1.22). Additionally, respondents whose institutions do not have an established WAC program approach agreement (M = 3.56, SD = 1.03) with the statement. Respondents whose institutions have an established or developing WAC program approach disagreement with the statement (M = 2.50, SD = 1.16). Further breakdown of the data shows that respondents whose institutions are developing a WAC program neither agree nor disagree with the statement (M = 3.00, SD = 0.81), while those reporting an established WAC program approach disagreement with the statement (M = 2.3, SD = 1.25).

Respondents neither agree nor disagree that instructors would be willing to incorporate more communication assignments into existing curricula to enhance students' communication skills (M = 3.54, SD = 0.80). There are no statistically significant differences in responses to this statement based on respondent position, institutional affiliation, or WAC program status.

Respondents neither agree nor disagree with the idea that communication skills should be taught by English and speech teachers (M = 2.47). Again, a high standard deviation (1.08) indicates a wider range of

opinion on this point. Mann-Whitney analysis shows a significant difference in responses based on WAC program status (see Table 7). Those respondents indicating no WAC program neither agree nor disagree with the statement (M = 2.78, SD = 1.17), while those reporting an established or developing program disagree (M = 1.92, SD = 0.64). There were no statistically significant differences in responses to this statement based on respondent position or institutional affiliation.

Table 6. Perceived important of four types of communication based on respondent's position, by University of Aviation Association members, 2003

	Mini-mum Value	Maxi-mum Value	M	SD
Oral Communications				
Department chairperson	4	5	4.88	0.33
Senior faculty	2	5	4.33	0.98
Written Communications				
Department chairperson	3	5	4.60	0.58
Senior faculty	1	5	3.75	1.21
Electronic Communications				
Department Chairperson	3	5	4.24	0.72
Senior faculty	3	5	3.75	0.75
Visual Communications				
Department Chairperson	3	5	4.28	0.61
Senior faculty	2	5	3.58	0.99

Note. A total of 25 department chairpersons and 12 senior faculty members responded.

Research Question 5

The fifth research question asked the following: What are aviation educators' perceptions of their institution's willingness to facilitate the implementation of more communication assignments.

Respondents neither agree nor disagree (M = 2.81) that their institution would offer some benefit or incentive to instructors who incorporate more communication assignments into their courses. The standard deviation of 1.17 indicates more variation in the responses received for this item.

Neither institutional affiliation nor respondent position had any significant effect on responses to this question. However, differences in responses based on WAC program status are statistically significant (see Table 7). Respondents whose institutions do not have a WAC program in

place neither agree nor disagree (M = 3.17) with the premise that their institution would consider a benefit/incentive for instructors incorporating more communication assignments. There is, however, a wide range of opinion among these respondents (SD = 1.19). Those whose institutions have a WAC program in place or are developing one do not agree that benefits/incentives would be considered (M = 2.21, SD = 0.89).

Research Question 6

The sixth research question asked the following: What are the perceptions of aviation educators regarding the benefits of WAC in collegiate aviation.

While ten respondents indicated having an established WAC program, only six of them (five department chairpersons and one senior faculty member) responded to the question regarding benefits. Of the six benefits to a WAC (see Appendix B), two benefits averaged a moderate rating or better (see Table 3). Respondents indicated that the WAC program benefited students by helping to improve the mechanics of student writing (M = 4.00, SD = 0.63) and helping to improve the student's ability to express ideas clearly and convey messages accurately (M = 4.16, SD = 0.41). The remaining four benefits were rated as being of some to moderate benefit to students. The uneven split between such a small number of department chairpersons and senior faculty members responding precludes further meaningful analysis of responses based on position. Chi-square and Mann-Whitney analysis revealed no significant differences in responses based on institutional affiliation.

When given the opportunity to list a benefit not already given, one respondent reported a "diminished opposition or willingness to complete written and oral assignments" as a very noticeable benefit that students derived from the program. Another respondent indicated the student's ability to "comply with a given format specification (e.g. APA)" as a very noticeable benefit.

Of the six respondents, five indicated anecdotal evidence of improvements in students' communication skills and one indicated no evidence of improvement. Inspection of the data reveals that the one respondent indicating no evidence of improvement is a senior faculty member, while the rest are department chairpersons.

Table 7. Results of Mann-Whitney analysis of statements about communication training and assignments incorporating specific communication skills, by University Aviation Association members, 2003

	Respondent position		*Institutional affiliation*		*WAC program status*	
	U	*p*	*U*	*p*	*U*	*p*
Communication skills are important in the aviation industry.	130.5	0.32	148.0	0.55	137.5	0.25
Developing good communication skills goes hand-in-hand with developing the critical thinking skills necessary in the aviation industry.	126.0	0.36	135.5	0.36	142.0	0.48
Students entering my institution's aviation program already possess the communication skills necessary for an aviation career.	143.5	0.82	110.5	0.08	125.0	0.22
Students graduating from my institution's aviation program possess the communication skills necessary for an aviation career.	102.5	0.08	159.0	0.97	151.0	0.72
My institution's general education coursework prepares students to communicate effectively in the industry.	67.5	0.00*	132.5	0.34	149.0	0.68
My institution's aviation program prepares students to communicate effectively in the industry.	77.5	0.00*	153.5	0.81	139.0	0.41
The purpose of writing assignments within my institution's aviation programs is to enhance the student's knowledge of course material (writing-to-learn).	98.5	0.05*	146.0	0.59	136.0	0.35
The purpose of writing assignments within my institution's aviation programs is to enhance the student's ability to communicate effectively through writing (learning-to-write).	114.0	0.15	152.5	0.77	153.0	0.75
My institution's aviation program(s) could do better at preparing students to communicate effectively in industry.	146.5	0.89	140.5	0.47	125.5	0.20

Table 7. Results of Mann-Whitney analysis of statements about communication training and assignments incorporating specific communication skills, by University Aviation Association members, 2003 (continued)

	Respondent position		*Institutional affiliation*		*WAC program status*	
	U	*p*	*U*	*p*	*U*	*p*
Instructors at my institution incorporate adequate communication assignments into their courses to prepare students for an aviation career.	78.5	0.01*	127.0	0.25	67.0	0.00*
Incorporating more writing/speaking assignments into my institution's aviation programs would limit the amount of aviation material instructors could cover in each course.	106.5	0.14	91.0	0.02*	82.5	0.01*
Instructors at my institution would be willing to incorporate more written, oral, electronic, and/or visual communication assignments into existing curricula to enhance students' communication skills.	126.0	0.40	156.0	0.89	128.0	0.26
Communication skills should be taught by English and speech teachers, not aviation faculty.**	109.0	0.21	125.5	0.34	87.0	0.02*
My institution would consider some additional benefit/incentive for instructors who incorporate more communication assignments into their courses.	145.5	0.88	128.0	.29	86.5	0.01*

N = 37 for all, but one, statement.
**N = 36.
*p < .05.

CONCLUSIONS

It appears that respondents generally believe that it is very important for students to have a good grasp of communication skills upon graduating from a program preparing them for a career in aviation. While each individual communication skill is perceived as important, respondents rate oral communication skills most highly, followed by written, electronic, and visual communication skills, respectively.

While respondents do not feel that students entering their programs possess the communication skills required for an aviation career, they do believe that their programs prepare their graduates to communicate effectively. They also appear to believe that there is room for improvement

within the program as far as communication training goes. Department chairpersons appear to have a higher opinion of the institution's ability to teach students communication skills than do senior faculty members.

Respondents agree that the purpose of writing assignments is both to enhance writing skills and improve knowledge of course content.

Initial analysis of responses to statements regarding the inclusion of more communication assignments in courses yields fairly neutral results. While it appears overall that respondents are not overly receptive to the integration of more communication assignments in their courses, they also are not overtly opposed. Of course, opinions varied widely and that must be considered. Further analysis shows that respondents from institutions with established WAC programs are more likely to agree that their instructors already incorporate sufficient communication assignments into their courses. They also are more likely to disagree with the statement that more writing and/or speaking assignments in the courses would limit the amount of aviation material they could cover in class.

Opinions also vary as to whether institutions would be willing and/or able to reward those teachers who do make an effort to include more communication assignments in coursework. Reasons for the differences in opinion based on WAC program status are unclear. One plausible explanation could be rooted in the program's ownership; this is, whether the push to establish a WAC program rooted among faculty or administration.

Finally, the results show that respondents perceive that a WAC program holds certain benefits for students, and some of these perceived benefits may be more noticeable than others. Given the anecdotal nature of any evidence, however, strong conclusions cannot be drawn from this study regarding the benefits of a WAC program as related to students' communication skills.

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APPENDIX A

STATEMENTS ABOUT COMMUNICATION TRAINING AND ASSIGNMENTS INCORPORATING SPECIFIC COMMUNICATION SKILLS

1.	Communication skills are important in the aviation industry.
2.	Developing good communication skills goes hand-in-hand with developing the critical thinking skills necessary in the aviation industry.
3.	Students entering my institution's aviation program already possess the communication skills necessary for an aviation career.
4.	Students graduating from my institution's aviation program possess the communication skills necessary for an aviation career.
5.	My institution's general education coursework prepares students to communicate effectively in the industry.
6.	My institution's aviation program prepares students to communicate effectively in the industry.
7.	The purpose of writing assignments within my institution's aviation programs is to enhance the student's knowledge of course material (writing -to-learn).
8.	The purpose of writing assignments within my institution's aviation programs is to enhance the student's ability to communicate effectively through writing (learning-to-write).
9.	My institution's aviation program(s) could do better at preparing students to communicate effectively in industry.
10.	Instructors at my institution incorporate adequate communication assignments into their courses to prepare students for an aviation career.
11.	Incorporating more writing/speaking assignments into my institution's aviation programs would limit the amount of aviation material instructors could cover in each course.
12.	Instructors at my institution would be willing to incorporate more written, oral, electronic, and/or visual communication assignments into **existing curricula** to enhance students' communication skills.
13.	Communication skills should be taught by English and speech teachers, not aviation faculty.
14.	My institution would consider some additional benefit/incentive for instructors who incorporate more communication assignments into their courses.

APPENDIX B

PERCEIVED BENEFITS OF A WRITING ACROSS THE CURRICULUM PROGRAM

1. Improve mechanics of student writing (spelling, grammar, punctuation)
4. Improve student's oral communication (eliminating "ums," "you knows," etc.)
5. Improve student's computer literacy (use of work processing, email, Web searches, etc.)
6. Improve student's ability to express ideas clearly and convey messages accurately
7. Improve student's logic, thought processes, and problem solving skills
8. Enhance student's learning and understanding of course material
9. Other, please specify