PROPOSED IMPROVEMENTS IN COLLEGIATE AVIATION EDUCATION

By
Robert M. Kuhns, Ed. D.
Adjunct Assistant Professor
Embry-Riddle Aeronautical University
McConnell AFB Resident Center, Wichita, Kansas

March, 1995
Abstract

This paper presents findings related to proposed improvements in four-year aviation education programs as indicated by nation-wide survey instruments conducted in summer of 1993. Aviation education programs directors of four-year non-engineering collegiate aviation programs were contacted to provide input as to methods of improving the quality of aviation education programs. Key information obtained was then paraphrased into a written instrument that was categorized in order of importance by the program directors.

The improvement of both faculty and facilities and to provide more student internships were the most recommended improvements in this study. This paper provides multiple nationwide-ranked proposed improvements in aviation education, and describes peer-suggested methods of improving student attainment of knowledge, competency, and proficiency in aviation education.
Data were collected in the summer of 1993 to ascertain the perceived quality of four-year and higher aviation education programs throughout the nation. The following information was part of the author's doctoral thesis in which a multitude of information was acquired. This information was obtained from program coordinators, department heads, or similar individuals at the various institutions throughout the United States (N = 68). A copy of the telephone interview questionnaire is found in Appendix A. Objective and subjective data were obtained from program directors in this study. Demographics as well as opinions were acquired. Key factors concerning aviation education were then organized into a second instrument. Aviation department heads were mailed the instrument and asked to rank in importance the various key factors. This instrument is found in Appendix B.

The University Aviation Association membership list was used to identify four-year and higher non-engineering aviation education programs offered in the United States. Aviation programs less than four years were not considered in this study. The UAA April 1992 Membership List contained the names of 106 member institutions of which 68 were found by the survey to offer four-year and greater aviation programs. (University Aviation Association, 1992). In the process of calling all 106 member institutions an updated number (68) of institutions that offer four year and higher aviation education programs was obtained.

The first questionnaire requested information of both a quantitative nature and a subjective nature. Student number, faculty demographics, future educational plans, aviation equipment and facilities, intra state student accessibility, and student recruiting were surveyed. More difficult questions were asked of the program department chairs in which program quality, ranking against a national norm, current program status, factors contributing to quality aviation education, and which institution was considered to offer the best aviation education program in the United States.

The second questionnaire asked aviation program directors to rank key quality factors from most important to least important. These key factors were obtained from the most frequent responses in the telephone interview questionnaire.

**Operational Procedures**

All of the 68 identified member institutions were contacted by phone to conduct a structured phone interview. Confidentiality was assured to all participants. All institutions were contacted a minimum of four times to maximize responses. If a program director was unable to respond after four attempts, the institution was deleted from the survey. This was strictly random with no bias on the part of the telephone interviewer.
A telephone questionnaire technique allowed subjects to be more open in their responses, and if needed to ask for clarification concerning questions. The telephone technique also encouraged more detailed responses and provided for greater participation than mailed format questionnaires. This procedure may be considered successful if it has greater than the success rate accepted by research authorities of 55% (Perry, 1988).

The telephone questionnaire was written and submitted for evaluation to the researcher's doctoral committee. The recommended changes were then incorporated into a second draft, then it was presented to experts in questionnaire design, and modifications were adopted. The questionnaire was also presented to experts in English and Grammar at Wichita State University. Next it was presented to several program directors at member institutions for input. Finally the final draft was again presented to the doctoral committee. A small pilot group was then selected and a phone interview was conducted. After several interviews small changes were adapted to clarify and to improve understanding of the questionnaire. One additional question was also added (number 21) as per suggestion of a member of the pilot group. The second (written) instrument underwent a similar process and was approved by the doctoral committee before it was mailed.

The pilot group consisted of a former director of an aviation education program, a member of a nationwide aviation study, and several of the doctoral committee members. The revised final drafts were then presented to the researcher's committee chairman for final approval. Developmental and validation processes were then completed for this instrument.

Research Design and Analysis

The findings of this study, drawing on its qualitative and quantitative data, are presented in a descriptive design. Findings included program age, curriculum offered, future curricular plans, faculty demographics, equipment and aviation facilities, student recruitment, CAA membership, and follow-up of graduates. This information although obtained will not be presented in this paper. Subjective responses recorded on aviation program quality, factors that constitute a high quality aviation education program, and methods of improving quality of aviation education will be presented in this paper. Findings were organized in a descriptive and summarizing format to assure confidentiality to all participants.

Factors Contributing to the Quality of Aviation Education

One question asked of program directors in this survey was what factors did they feel constitute a good aviation program. The question was completely open ended. For brevity similar responses were combined. The following, in order of number of times mentioned, is listed on the next page:

Factors Associated with the Quality of Aviation Education

(Listed in order of number of times cited)
Proposed Improvements in Collegiate Aviation Education

High Quality Faculty
Good Overall Program
High Quality Facilities
High Quality Students
Strong Flight Simulator Department
Academic Support
Concentration of Aviation Studies
Networking with Aviation Industry
Student Job Placement
Blend of Liberal Arts Curriculum
Student Oriented Faculty
Professional Program
General Business Background
Internships in Industry
Good Communication Skills
New Curriculum
Adequate Funding of Program
Program Safety

Necessary Factors to provide Excellence in Aviation Education

(Listed in order of number of times cited)

High Quality Faculty
High Quality Facilities
Networking with Aviation Industry
High Quality Aviation Program
Academic Support
Adequate Funding of Program
Professional Program
Conduct Research in Aviation
Program contain Interested Students
Variety of Aviation Courses Offered
Student Oriented Faculty
Industry Involvement in Curriculum

*Eight other responses recorded in survey mentioned only once, and are not listed in above factors.

The next survey question asked the respondent to comment on factors that make a high quality aviation education. The question was, "What do you feel is necessary in order to provide excellence in Aviation Education?" This is similar to the preceding question, however the word excellence was emphasized by the interviewer. Some of the same responses occur in the next list, however it is interesting to note that many different responses were obtained when excellence was in fact substituted for good.
Proposed Improvement in Collegiate Aviation Education

Provide Job Placement Services
Greater Emphasis on Aviation Safety
Promote Critical Thinking Skills in Students
Provide Internships in Aviation Industry
Provide More Financial Aid To Students

Other Factors*

*Seven other responses recorded in survey mentioned only once, and are not listed in above factors.

Program directors were then asked, "If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?"

The most answered response was to improve facilities. The following list describes the responses given:

Proposed Improvements in Aviation Education

(Listed in order of number of times cited)

Improvement of Facilities
Improvement and Addition of Flight Simulators
Increase Faculty Number
Increase number of Available Aircraft
Improve Teaching Aids
Increase number of Aviation Programs

Increase Student Recruitment
Increase Marketing Budget
Increase number of Hands-On Activities
Provide More Student Internships
Increase Faculty Travel
Improve Student Placement System

Increase Industry Involvement
Add Masters Degree Program In Aviation
Increase Library Resources
Initiate Research Center
Increase Number of Field Trips
Offer Additional Scholarships
Increase Faculty Development Programs

Other Factors*

*Five other responses recorded in survey mentioned only once, and are not listed in above factors.

The top 12 responses of each of the three preceding lists were then organized into a written questionnaire (see appendix B.) which was mailed to the UAA member institutions with four-year degree programs. These three questions were considered to be of greatest importance to establishing the norm of quality aviation education throughout the United States. The top 12 responses were chosen to make the ranking
by the program directors less difficult. All responses that were recorded more than twice on the original survey were included. The ranking of each of the top 12 groups of responses in a written format allowed for both a reaffirmation of previous oral responses and the opportunity to rank the other respondents opinions.

Forty two program directors returned the survey. This is a response rate of 61.8%. When asked to rank the factors of a high quality aviation education the following responses were obtained. (See Table I) The following method was employed to determine rank. A point system was used in the following manner. When a factor was ranked first, twelve points were awarded to this factor. If that factor ranked second, eleven points were awarded. This system was applied down to the lowest rated factor, which received only one point. By using this method rank can be established, by noting the factor that obtains the highest number of points. The factors are also listed in order from highest to lowest. The following table summarizes the responses. (Table I)
### TABLE I

**FACTORS OF HIGH QUALITY AVIATION EDUCATION PROGRAMS**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Quality Faculty</td>
<td>437</td>
</tr>
<tr>
<td>Good Overall Program</td>
<td>350</td>
</tr>
<tr>
<td>Student Oriented Faculty</td>
<td>334</td>
</tr>
<tr>
<td>High Quality Students</td>
<td>319</td>
</tr>
<tr>
<td>Academic Support</td>
<td>316</td>
</tr>
<tr>
<td>Professional Program</td>
<td>272</td>
</tr>
<tr>
<td>High Quality Facilities</td>
<td>260</td>
</tr>
<tr>
<td>Networking With Aviation Industry</td>
<td>258</td>
</tr>
<tr>
<td>Concentration Of Aviation Studies</td>
<td>204</td>
</tr>
<tr>
<td>Student Job Placement</td>
<td>196</td>
</tr>
<tr>
<td>Blend Of Liberal Arts Curriculum</td>
<td>191</td>
</tr>
<tr>
<td>Strong Flight Simulator Department</td>
<td>143</td>
</tr>
</tbody>
</table>
The survey responses indicated that a high quality faculty is the number one response by a large factor. This was the most cited factor and was ranked by the mail survey also as the number one factor. A good overall program was the second highest cited response, and it was also second highest in the mail survey. However, the third ranked response was student oriented faculty which ranked eleventh in the phone survey. Fourth place in the mail survey was high quality students, with academic support following. The top ranked six responses are as follows:

Factors of High Quality Aviation Education Programs
(Top Six Responses)

- High Quality Faculty
- Good Overall Program
- Student Oriented Faculty
- High Quality Students
- Academic Support
- Professional Program

Survey respondents were then asked to rank the necessary factors to provide excellence in aviation education. The following table provides the results by the use of the point system as previously described. (Table II)
### TABLE II

NECESSARY FACTORS TO PROVIDE EXCELLENCE IN AVIATION EDUCATION

<table>
<thead>
<tr>
<th>Statement</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Quality Faculty</td>
<td>430</td>
</tr>
<tr>
<td>Student Oriented Faculty</td>
<td>372</td>
</tr>
<tr>
<td>High Quality Aviation Program</td>
<td>333</td>
</tr>
<tr>
<td>Adequate Funding Of Program</td>
<td>322</td>
</tr>
<tr>
<td>Academic Support</td>
<td>311</td>
</tr>
<tr>
<td>Professional Program</td>
<td>287</td>
</tr>
<tr>
<td>Program Contains Interested Students</td>
<td>250</td>
</tr>
<tr>
<td>High Quality Facilities</td>
<td>220</td>
</tr>
<tr>
<td>Industry Involvement in Curriculum</td>
<td>213</td>
</tr>
<tr>
<td>Networking with Aviation Industry</td>
<td>206</td>
</tr>
<tr>
<td>Variety of Aviation Courses Offered</td>
<td>204</td>
</tr>
<tr>
<td>Conduct Research In Aviation</td>
<td>101</td>
</tr>
</tbody>
</table>
High quality faculty was the number one ranked response in both the telephone survey by citation and in the mail survey by ranking. The second highest cited response high quality facilities did not make it to the top six responses falling to eighth place in the mail survey ranking. The mail survey ranked a student oriented faculty as the second highest response which barely made the top twelve factors of the original list. The top six necessary factors to provide excellence in aviation education are as follows:

**Necessary Factors To Provide Excellence In Aviation Education**

(Top Six Responses)

- High Quality faculty
- Student Oriented Faculty
- High Quality Aviation Program
- Adequate Funding of Program
- Academic Support
- Professional Program

Finally program directors were asked to rank twelve proposed improvements in aviation education. The following table represents by the aforementioned point system the rank established by the mailed survey: (Table III)
Provisioned Improvement in Collegiate Aviation Education

TABLE III

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

<table>
<thead>
<tr>
<th>Statement</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide More Student Internships</td>
<td>348</td>
</tr>
<tr>
<td>Increase Faculty Number</td>
<td>345</td>
</tr>
<tr>
<td>Increase Number Of Hands On Activities</td>
<td>332</td>
</tr>
<tr>
<td>Improve Teaching Aids</td>
<td>318</td>
</tr>
<tr>
<td>Improve Student Placement System</td>
<td>302</td>
</tr>
<tr>
<td>Improvement Of Facilities</td>
<td>300</td>
</tr>
<tr>
<td>Increase Student Recruitment</td>
<td>274</td>
</tr>
<tr>
<td>Improvement And Addition Of Flight Simulators</td>
<td>240</td>
</tr>
<tr>
<td>Increase Marketing Budget</td>
<td>233</td>
</tr>
<tr>
<td>Increase Number Of Available Aircraft</td>
<td>207</td>
</tr>
<tr>
<td>Increase Faculty Travel</td>
<td>168</td>
</tr>
<tr>
<td>Increase Number Of Aviation Programs</td>
<td>159</td>
</tr>
</tbody>
</table>
Surprising to the author the number one ranked response was to provide more student internships. Not that this is not a good response, but it almost did not make the top twelve cited list, coming in at tenth place. Also improvement of facilities the number one cited response fell to sixth place in the mailed survey. The following list represents the top six ranked proposed improvements in aviation education:

**RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION**

(Top ranked six factors)

- Provide More Student Internships
- Increase Faculty Number
- Increase Number of Hands on Activities
- Improve Teaching Aids
- Improve Student Placement System
- Improvement of Facilities

This study provided a peer-referenced national-based group of proposed improvements in collegiate aviation education. It is the hope of the author that this work will provide a basis for such improvements. Obviously some improvements are more practical to initiate than others, however with the peer-referenced priorities as established in this study the program director may be guided in decisions involving improvements in educational quality.
BIBLIOGRAPHY


Perry, K. (1988). *Designing Questionnaires*. ABSED5720.08, Oklahoma State University, Stillwater, OK.


AVIATION EDUCATION TELEPHONE SURVEY
APPENDIX A

Institution name

Street Address

Contact person

Title Phone

Date Time

1. What is the size of your parent institution?

2. How many Aviation education students are currently enrolled? AS__, BS__, MBA__, MS__,
   Ed.D__, Ph.D__,
   Other__(if so, please specify)

3. What is the highest aviation degree offered?
   Circle one: AS BS MBA MS Ed.D Ph.D

4. Within the next two years, does your institution plan to offer any higher level Aviation education degrees than presently offered? Yes__ No__. If yes what? (circle) BS, MBA, MS, Ed. D., Ph. D., Other ____________

5. What year was your aviation program established?

6. Faculty demographics:
   Number of full time aviation faculty
   Number of part time aviation faculty
   Number of minority aviation faculty
   Number of women aviation faculty
   Number of aviation faculty with degree higher than baccalaureate
   Number of aviation faculty with degree higher than masters
Proposed Improvement in Collegiate Aviation Education

7. Using a scale of 1 to 5 with 5 being highest quality how would you rate your aviation program as compared to other similar programs? 1 2 3 4 5

8. How do you feel your aviation program would rate against a nationwide norm?

   One of the best
   Better than most
   Average
   Somewhat below the norm
   One of the worst

9. Does your institution offer any aviation education scholarships? Yes No If so, what types?

10. Would you characterize your aviation education program as growing, remaining constant, or declining in student number? (circle one) What factors do you attribute this to?

11. What factors constitute a good Aviation Education program?

12. What do you feel is necessary in order to provide excellence in Aviation Education?
13. If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?

14. What options are available in your Aviation Education program? (Check those that apply)

Aviation Management Program
Flight Training
Aircraft and Powerplant Training
Airway Science:
- Airway Science Management
- Airway Computer Science
- Aircraft Systems Management
- Airway Electronic Systems
- Aviation Maintenance Management
Other

15. What institution in your opinion offers the best aviation education in the United States.

In four year programs?

At masters level or higher?

16. How would you rate your institution in relation to one or more of the preceding best institutions on a scale of 1-5 with 5 being the aforementioned institution? 1 2 3 4 5

17. How many of the following are available in your program?

- Flight training aircraft
- Flight training simulators
- Certified Flight instructors
- Certified Ground instructors
- Aviation Scholarships

18. Would you describe your program as being accessible to
students from other states? Yes____ or No____. If yes, to what degree do you rate your institution's accessibility?

- Very accessible____________________
- Somewhat accessible________________
- Limited accessibility_______________

19. Do you actively recruit students? Yes ____ No ____.
If so, how? ____________________________________________________________

20. Do you follow-up on graduates? Yes ____ No ____.
If so, how frequently? _________________________________________________

21. Is your institution currently a member of The Council on Aviation Accreditation? Yes____ No ____ Do you plan to join in the future? Yes ____ No ____
Early this summer I contacted you by phone to participate in my doctoral dissertation study about aviation education. Those of you that participated in the previous study provided me with some interesting results. Three key questions of the survey have been paraphrased below with their most frequent responses. Please rank (1-12) the responses in order of importance (1 being the most important) and return your response to me in the self addressed stamped envelope.

Statement: Factors of High Quality Aviation Education Program

Rank (in order of importance)

1. Concentration of Aviation Studies
2. Blend of Liberal Arts Curriculum
3. High Quality Faculty
4. Professional Program
5. High Quality Facilities
6. High Quality Students
7. Strong Flight Simulator Department
8. Academic Support
9. Good Overall Program
10. Networking with Aviation Industry
11. Student Job Placement
12. Student Oriented Faculty
Proposed Improvement in Collegiate Aviation Education

Statement: Necessary Factors to provide Excellence in Aviation Education

Rank (in order of importance)

1. Variety of Aviation Courses Offered
2. Professional Program
3. High Quality Facilities
4. Networking with Aviation Industry
5. High Quality Aviation Program
6. Academic Support
7. Adequate Funding of Program
8. Industry Involvement in Curriculum
9. Conduct Research in Aviation
10. Program contain Interested Students
11. High Quality Faculty
12. Student Oriented Faculty

Statement: Proposed Improvements in Aviation Education

Rank (in order of importance)

1. Increase number of Hands On Activities
2. Improve Teaching Aids
3. Improvement and Addition of Flight Simulators
4. Increase Faculty Number
5. Increase number of Available Aircraft
6. Improve Student Placement System
7. Increase number of Aviation Programs
8. Increase Student Recruitment
9. Increase Marketing Budget
10. Improvement of Facilities
11. Provide More Student Internships
12. Increase Faculty Travel

In order that I may complete my doctoral dissertation research in a timely manner please respond as quickly as possible. A control number has been assigned so that I may track responses. Your response will be kept confidential.

Thank you,

Robert M. Kuhns