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WORK-BASED LEARNING: THE AVIATION MANAGEMENT ENVIRONMENT

D. Scott Worrells

Abstract

The purpose of the study was to analyze and describe the work-based learning environment in post-secondary aviation management programs. The study was limited to colleges and universities affiliated with the University Aviation Association (UAA).

Over 90% of colleges and universities offer some form of work-based learning (WBL) for students providing experiential learning opportunities. Teacher preparation programs, medical education, and many business programs incorporate work-based learning into the education process (Swail & Kampits, 2004, p. 3).

The term work-based learning denotes a wide range of university-business partnerships that includes, but is not limited to, cooperative education and internship. Aviation-related partnerships between business and education began as maintenance apprenticeships. Gradually, they evolved into cooperative education and internship. Throughout this evolution, there were no accepted standards for these types of activities. Their definitions and applications were as diverse as the students, industry sponsors, and institutions that participated in them. Work-based learning has and continues to be, an important component of Aviation Management (AVM) with cooperative education and internship being the two prominent forms. Implementation of WBL has paralleled the evolution of AVM programs; with an inter-dependent relationship developing over the years.

Aviation management remains a relatively young academic program that continues to grow and evolve. There is evidence from this study that WBL plays an important part in preparation for a career in the aviation industry; by bridging the gap between a student's academic career and the real world of work.

Methodology

A self-developed research instrument was used in the study. A pre-survey was employed that identified 70 AVM programs having WBL and who agreed to participate

in the study. Survey participants were directed to an on-line questionnaire, of which 57 (81%) were eventually submitted for analysis. Data were analyzed using conventional descriptive statistics.

Literature Review

Schukert (1993, Winter) found that 71.9% of employer participants in WBL were from the public sector: federal government agencies (59.6%), airport authorities (8.8%), and state government agencies (3.5%). The remaining 28.1% of participants were from the private sector: airlines (10.5%), fixed base operations (7.0%), and various other aviation enterprises (10.6%). Schukert provided five examples of the degree to which WBL has been institutionalized among participants: (a) administering legal/formal agreements among sponsors, (b) designating a course title and number, (c) granting academic credit and issuing a grade, (d) specifying student participation requirements, and (e) sponsoring industry advisory committees.

Owens (1995) reported on an evaluation of The Boeing Company's internship program. The purpose of the evaluation was to: (a) describe the operations and outcomes of the internship, (b) provide information for continuous quality improvement of the internship, (c) document the impact of the internship on students and others, and (d) identify promising practices related to the internship that could be adapted by others in business and industry. Evaluation methodology included: (a) a review of documents describing the internship structure, student selection process, and curriculum; (b) a survey of interns before and after a summer internship; and (c) a follow-up study of work and educational experiences since high school graduation.

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Findings of the study revealed that: (a) 22 interns (91.7%) reported increasing their understanding of manufacturing, (b) 2 interns (8.3%) were influenced to stay in school, (c) 20 interns (83.3%) reported that the experience had enhanced or confirmed their career plans, (d) 24 interns (100%) were motivated to go on to postsecondary education following high school, and (e) 16 interns (66.7%) reported that the experience had improved their workplace and employability skills (Owens, 1995).

Luedtke and Papazafropoulos (1996) studied retention issues as related to academic programs and the field of aviation in general. Pattie et al. (as cited in Luedtke & Papazafropoulos) identified WBL as a key component of student retention.

Fuller and Truitt (1997) in a study of airport consultants revealed that WBL industry sponsors had a very positive attitude toward their participation in, and benefits from WBL activities. "We feel very strongly that the internship component is one of the strengths of our program. One can not be effective without real world experience" (Fuller & Truitt, p. 68).

Prather (1999) reported on the findings of a study on airport executives nationwide regarding the most important airport departments in which an intern should gain experience, the benefits of internship programs, and the recommended structure of a departmental rotation internship. This study is indicative of the specificity to which internships have evolved. "... the goal is to arrive at the most appropriate structure of a departmental rotation internship program. Specifically, which airport departments

should the intern experience and how much time should be spent in each department?" (Prather, p. 59).

Respondents to a survey by Mitchell (2000) reported the following strengths, weaknesses, and opportunities in WBL activities. *Strengths*: (a) internship provides a foot in the door, (b) students and schools keep abreast of the industry, and (c) internship provides invaluable experience for the intern. *Weaknesses*: (a) student participation is low, (b) most internships are not paid, and (c) programs are too easy. *Opportunities*: (a) institutions need to promote internship better, (b) institutions need to work out the problems associated with remuneration, (c) more internship opportunities need to be established, (d) meaningful work experiences are essential to a successful internship, and (e) coordination and implementation of a feedback system, from past interns to future interns, will improve the program.

Work-based Learning: The Aviation Management Environment

The research instrument consists of section A. *Background Information*, (12 items) and section B. *Institutional Demographics*, (7 items). Data for each section are presented and discussed separately.

Background Information

The intent of this section is to solicit data regarding the AVM environment in which WBL is offered. Data for the 12 questions that comprise this section are aggregated in Table 1 and summarized below.

Table 1

Nature of the WBL Environment: Background Information

Question						
1.	How many full-time, tenure/tenure-track faculty members are in the AVM program?	<u>TOT</u> 207	<u>AVG</u> 3.8	<u>f</u> 55		
2.	What is the average number of part-time, non-tenure-track faculty members in the AVM program?	<u>TOT</u> 234.5	<u>AVG</u> 4.2	<u>f</u> 56		
3.	List the number of options, specializations, and/or minors that are offered in the AVM program.	<u>Credit Hours</u>				
		<u>T</u> <u>O</u> <u>T</u>	<u>MIN</u>	<u>MAX</u>	<u>AVG</u>	<u>f</u>
	a. Options	15	12	74	39.3	6
	b. Specializations	41	5	122	45.6	15
	c. Minors	29	9	25	16.6	19
4.	Is your AVM program accredited by the CAA?	<u>TOT</u>	<u>%</u>	<u>N</u>		
	a. Yes	18	31.6	57		
	b. No	39	68.4	57		
5.	If your AVM program is not accredited by the CAA, are there plans to pursue accreditation?	<u>TOT</u>	<u>%</u>	<u>f</u>		
	a. Yes	26	66.7	39		
	b. No	13	33.3	39		
6.	In what year did your program first implement WBL?	<u>Earli</u> <u>est</u> 1957	<u>Latest</u> 2004	<u>N</u> 57		
7.	How many AVM majors were enrolled in the 2004-05 academic year?	<u>TOT</u> 4595	<u>AVG</u> 85.1	<u>f</u> 54		

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Table 1 (continued).

		<u>MIN</u>	<u>MAX</u>	<u>AVG</u>	<u>f</u>
8.	How many credit hours are required for the AVM major?				
a.	Four-year college/University	120	142	124.3	49
b.	Community college	60	77	64.4	8
9.	What GPA is required prior to participating in WBL?	<u>MIN</u>	<u>MAX</u>	<u>AVG</u>	<u>f</u>
		2.0	3.3	2.5	40
10.	Credit hours required to participate in WBL.				
a.	Four-year college/University	<u>MIN</u>	<u>MAX</u>	<u>AVG</u>	<u>f</u>
b.	Community college	3	103	57.4	35
		9	34	20.6	5
11.	What percentage of 2004-05 academic year AVM graduates participated in WBL sometime in their academic career?	<u>MIN</u>	<u>MAX</u>	<u>AVG</u>	<u>N</u>
		0	100	0.3	57
12.	In which of the following businesses have students been placed?		<u>TOT</u>	<u>%</u>	<u>N</u>
	a. Airline		48	84.2	57
	b. Airport		53	93.0	57
	c. ATC		18	31.6	57
	d. FBO		46	80.7	57
	e. Corporate aviation		43	75.4	57
	e. Consulting firm		26	45.6	57
	f. Flight instruction		34	59.6	57
	g. Manufacturing		18	31.6	57
	h. Local Government		20	35.1	57
	i. State Government		25	43.9	57
	j. Federal Government		27	47.4	57
	k. Other		5	8.8	57
	1. U.S. Military		3	5.3	57
	2. Professional Aviation Associations		1	1.8	57
	3. Foreign Government		1	1.8	57

Note. TOT = Total. AVG = Average. MIN = Minimum. MAX = Maximum.

Faculty. Questions 1 and 2 request data regarding the number of tenure and non-tenure faculty. The 55 respondents to these questions report a total of 207 “full-time, tenure/tenure-track faculty” and 233 “part-time, non-tenure-track faculty.” Thus, AVM programs employ slightly more non-tenure-track than tenure/tenure-track faculty by a ratio of 1.12:1.

Program type and credit hours. Question 3 asks respondents to provide data regarding the number of options, specializations, and minors offered within the AVM program (major) and the credit hours associated with each. Only 35 respondents provide data for this item. Six AVM programs offer a total of 15 “options” with an average of 39 credit hours, 15 programs offer 41 “specializations” with an average of 46 credit hours, and 19 programs offer 29 “minors” with an average of 17 credit hours. Obviously, a number of programs offer options, specializations, and minors in various combinations since 35 respondents report offering 85 combinations. However, the range of credit hours assigned to options, specializations, and minors was not anticipated. The range of credit hours for minors is between 9 to 25 credit hours for an average of 16.6 credit hours. The range of credit hours for options and specializations is, at best, inconsistent. For example, the minimum number of credit hours for options is 12, the maximum is 74, for an average of 39.3. The minimum number of credit hours for specializations is 5, the maximum is 122, for an average of 45.6. Respondents provided no explanation for the wide variation in credit hours assigned.

Accreditation status. Aviation management programs can attain accreditation from the Council of Aviation Accreditation (CAA). The accreditation status of AVM programs is the focus of questions 4 and 5. Eighteen (32%) respondents report that they are presently accredited by the CAA. Of the remaining 38, 25 (65%) report that they are, or will be, pursuing accreditation. The other 13 (34%) have no plans to pursue accreditation. This data indicates a trend toward accreditation and a logical step in the evolution of AVM programs. Flight programs and maintenance programs have long benefited from being sanctioned by the Federal Aviation Administration. No such sanction is extended to AVM programs. Accreditation of an AVM program lends a degree of legitimacy to the program and enhances its stature as a stand alone, independent program, offering a primary career path for aspiring aviators.

Majors and credit hours. In questions 7 and 8, respondents are asked to address student enrollment and credit hour requirements for the AVM major. The 54 respondents report a total of 4,595 majors or an average of

85 AVM majors per institution. Respondents at 46 four-year colleges/universities report that the average number of credit hours required for the AVM major is 124, while 8 community college respondents report that their average is 64. The credit hours reported are inclusive of all credit hour requirements for a baccalaureate or an associate degree, respectively. Some respondents are on the quarter hour system; therefore a quarter hour to semester hour ratio of 1.5 to 1 (“University Core Curriculum,” 2006, p. 73) was applied to standardize the reporting of credit hours.

AVM and WBL. Questions 6, 9, 10, 11, and 12 focus on characteristics of WBL. Respondents to question 6 indicate that the first date of application of WBL in an AVM program is 1957 and the most recent is 2004. The indication is that over the past 48 years AVM programs have embraced WBL since all 57 respondents to this survey item report the application of one form of WBL or another. There is no indication that WBL had been terminated over this period of time.

In question 9, respondents are asked to indicate the grade point average (GPA) requirement for participating in WBL. The average GPA requirement is 2.5 (39 respondents), with 14 institutions (35%) requiring a minimum GPA of 2.0. The majority of institutions require no more than a “C” to participate in WBL. This finding is contradictory to what the author has experienced regarding GPA requirements of business and industry partners. Typically business and industry partners specify a GPA of 3.0 as the norm, with few exceptions.

Question 10 solicits information regarding the number of credit hours required to participate in WBL. Respondents at 34 four-year colleges/universities require an average of 57 credit hours prior to participating in WBL, while the 5 community college respondents report an average of 21 credit hours. These numbers raise questions regarding the requirements of four-year institutions and community colleges. Students at a four-year institution must, on average, complete nearly half (45%) of their degree requirements before being eligible for a WBL opportunity. Conversely, a student at a community college must, on average, complete less than a third (32%) of their degree requirements before being eligible for a WBL opportunity. Based on the author’s experience it is well outside the norm for students to participate in a WBL activity before their junior year.

Question 11 deals with the percentage of AVM graduates that participate in a WBL activity sometime during their academic careers. Respondents indicate that 0 to 100% of their 2004-05 graduates participate in WBL. The results of this question do not, individually, reveal any

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particularly relevant data. However, these data, when used in conjunction with the results of question 7, does provide further insight into the WBL environment. For example: the data from questions 7 and 11 reveals: (a) the minimum/maximum number of students (less than 1/180), (b) the total number of students (1,297.9), and (c) the average number of students (23.18) that participate in a WBL activity. These data indicate that the number of WBL participants varies widely; total and average numbers of participants are significant; and all three parameters exceed the numbers anticipated by the author.

The category of business or industry in which AVM students participate in a WBL activity is the focus of question 12. The data for this question are presented in rank order below:

- Airport: 93%
- Airline: 86%
- Fixed Base Operation (FBO): 82%
- Corporate aviation: 77%
- Flight instruction: 61%
- Consulting firm: 46%
- Local, state and federal governments: 43%
- Manufacturing: 32%
- Air Traffic Control: 32%
- Other: 3%

These data are more interesting than they may appear at first glance. The numbers of students participating at Airports, Consulting firms, and Manufacturing firms represent segments of the aviation industry in which an AVM major is most likely to acquire entry level employment following graduation. These numbers are

significant and reinforce the notion that AVM is evolving into an independent career path.

A career with an airline is the primary goal of the majority of aviation students. However, even an entry level position requires extensive experience. Successful completion of a WBL activity with an airline does not ensure employment. However, a guaranteed interview, upon attaining the requisite degree of experience, is a sought after and lucrative benefit of successfully completing the WBL activity. Therefore, the number of students participating in a WBL activity with an airline is logical.

The number of students participating in WBL activities at FBO's, Corporate aviation, and Flight instruction is also logical. Entry level positions at the airlines, without experience, are almost non-existent. So where does an aspiring aviator get the requisite experience to qualify for an airline job? Since about 1995, the career path to the airline industry is through general aviation (Hansen & Oster, 1997). And general aviation is made up, among other things, of FBO's, Corporate aviation, and Flight instruction. It is logical that general aviation (FBO's, Corporate aviation, Flight instruction) is the predominate segment of the industry in which students participate in WBL activities, and, in fact, general aviation outnumbers all other business and industry segments.

Institutional Demographics

This section of the research instrument is designed to collect data regarding characteristics of the institution in which AVM programs with WBL operate. Data for the seven items in this section are aggregated in Table 2 and summarized below.

Table 2

Nature of the WBL Environment: Institutional Demographics

Question		<i>f</i>	<u>%</u>
1.	How would you characterize your university's/college's community environment?		
	a. Rural/small town	18	31.6
	b. Suburban	9	15.8
	c. Urban	10	17.5
	d. Metropolitan	20	35.1
2.	Is your institution a:	<i>f</i>	<u>%</u>
	a. Community college	8	14.0
	b. Four-year college	7	12.3
	c. University	42	73.7
	d. Other (please specify)	0	0.0
3.	Which of the following describes an academic term at your university/college?	<i>f</i>	<u>%</u>
	a. Quarter	6	10.5
	b. Semester	51	89.5
	c. Trimester	0	0.0
	d. Other (please specify)	0	0.0
4.	What is the approximate resident student population of your university/college? <i>f</i> = 55	<u>TOT</u> 702.6k	<u>AVG</u> 12.8k
5.	Over the past two years enrollment at your university/college has been?	<i>f</i>	<u>%</u>
	a. Increasing	30	52.6
	b. Decreasing	8	14.0
	c. Stable	19	33.3

Table 2 (continued).

		<i>f</i>	<i>%</i>
6.	Which organizational level is responsible for the management of WBL?		
	a. Program	43	75.4
	b. College	8	14.0
	c. Central administration	3	5.3
	d. Other (please specify)	3	5.3
	1. Career center and department	1	1.8
	2. School	1	1.8
	3. NA	1	1.8
7.	What is your title or position?	<i>f</i>	<i>%</i>
	a. Dean	0	0.0
	b. Chair/director	29	50.9
	c. AVM program coordinator	8	14.0
	d. Faculty	9	15.8
	e. Academic advisor	0	0.0
	f. Other	11	19.3
	1. Assistant Dean	1	1.8
	2. Chair/director and Faculty	1	1.8
	3. Chair/director, Faculty, and Academic advisor	2	3.5
	4. AVM program coordinator, Faculty, and Academic advisor	1	1.8
	5. Faculty, and Academic advisor	2	3.5
	6. Academic program coordinator	1	1.8
	7. Chief Certified Flight Instructor	1	1.8
	8. Administrative	1	1.8
	9. Adult Continuing Education	1	1.8

Note. TOT = Total. AVG = Average. $k = 1000$. $N = 57$.

Community environment. The type of setting in which an institution is located may offer differing opportunities for WBL. The first question of this section inquires about the nature of the institution/community environment. Thirty-four percent of respondents report their community environment as "metropolitan" and a similar number (32%) report being located in a "rural/small town" environment. Approximately equal numbers of institutions are located in "suburban" (16%) and "urban" (18%) environments.

Type of institution. AVM programs are situated in both two- and four-year institutions. In question 2 and 3 respondents provide information on their institutional type

and its academic calendar.

The number of combined four-year colleges and universities, is 48 or 85% of the population. There are 8 community colleges representing 14% of the survey population. The lower number of community colleges represented in the study reflects the fact that community colleges, generally speaking, concentrate on either flight training or maintenance training. The AVM degree is most often provided at the baccalaureate level.

Responses to the 3rd question indicate that "semester" is the academic term used at 50 (89%) of the institutions reporting. The "quarter" is in use by the remaining 6 respondents (11%).

Student enrollment. The total resident student population of the 55 institutions reporting is 702,601. The resident student population ranges from 500 to 70,000, with an average of 12,774 students. Aviation management majors (4,595) represent .65% of the total resident student population of those institutions responding to this question. Enrollment trends over the past two years are reported as follows: (a) increasing (51%), (b) stable (33%), and decreasing (14%). Two respondents reported the elimination of their AVM programs.

Management of the WBL program. Question 6 asks respondents to provide information regarding the organizational level at which the WBL program is administered. The intent of question 7 is to identify the position or title of the person completing the survey instrument. Forty two respondents (75%) indicate their programs are managed at the Program level. Twenty nine respondents (51%) indicate that they are either a Chair or a Director of their program. Thus, the majority of respondents hold administrative positions, which is not particularly surprising.

Conclusions

Background Information

The earliest WBL program was initiated in 1957, but the majority of programs were implemented in 1986. There were 4,595 students enrolled in AVM programs during the 2004-05 academic year. Thirty-two percent of AVM program graduates participated in at least one WBL activity during their academic career.

Only about one third of AVM program are accredited by the UAA, but 26 additional programs plan to seek accreditation. An AVM student is somewhat more likely to be enrolled in a class taught by a part-time, non-tenure-track faculty member than a full-time, tenure/tenure-track faculty member. Aviation management programs provide a variety of options, specializations, and/or minors. At four-year institutions, the credit hour requirement for graduation ranges from 120 to 142 credit hours, and at community colleges the credit hour requirement for graduation ranges from 60 to 77 credit hours. Requirements for participation in WBL vary widely, however, with most four-year institutions requiring junior status and most community colleges requiring second semester freshman status. The average GPA requirement to participate in WBL at community colleges is 2.0, while the average for four-year institutions is 3.0. A variety of aviation industry businesses provide WBL opportunities with airports, airlines, general aviation, and government agencies being the most frequently cited.

Institutional Demographics

Work-based learning is most frequently conducted in rural/small town or metropolitan settings with an average resident student population of 12,800. Over the past two years, the student population has been increasing. Work-based learning activities are managed predominantly at the program level. The majority of survey respondents are academic administrators. →

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