will become a regular class offering in an alternate year scheduling. In conclusion, my experiment, I feel, was a success.

Availability of class materials

Copies of the course syllabus, class handouts, and questionnaire will be supplied to those interested upon request or can be accessed through the World Wide Web at WWW.Clemson.edu/Hort/DRD/Homepage.html.

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Implications of an Analysis of Job Newsletter Content, Readership, and Perceived Value for Student Advisement and Curriculum Development

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ADDITIONAL INDEX WORDS. employment search, recruiting, job programs, internships, guidance, placement services

SUMMARY. Recipients of a monthly horticultural job opportunities newsletter and firms or organizations listing positions in the newsletter were surveyed to determine the perceived value of the newsletter as a job search and recruitment tool, respectively. Survey information was used to develop a profile of the individuals and organizations using the newsletter. Original position descriptions on which the briefer newsletter listings were based were used to develop a profile of the industry segment, degree and/or experience requirements, geographic location, and starting salaries and benefits of positions listed from January 1993 to

December 1994. While the newsletter generated contact between prospective employees and employers, only 20% of the prospective employees received job offers by responding to newsletter listings. The newsletter was valued more by individual recipients as a job search tool than by institutional recipients or private industry as a recruitment tool. Starting salaries of listed positions were comparable to those previously reported in industry and academic surveys. Foreign language skills and previous work experience were requested more frequently than above-minimum (typically 2.00) grade point averages or completion of government or industry certification programs. Landscape-related disciplines constituted most BS or BA positions listed, whereas advanced degree positions were distributed more evenly over horticulture-related disciplines. Data supported the inclusion of internship programs and foreign language requirements in horticulture curricula.

A critical need in effective advising and curriculum development is current information on job opportunities for students and the required skills to acquire those positions (Dayberry and Dillingham, 1992). Current information on entry-level positions allows: advisors to direct students effectively to courses pertinent to their goals, faculty to develop industry responsive curricula, and teachers to structure courses to address relevant topics. In technical departments, such as departments of horticultural sciences, it is imperative that curricula and courses are developed and maintained according to industry trends. This is particularly important as universities seek to establish educational partnerships with industry (Jenkinson, 1994). Analysis of employment opportunities available in job newsletters is one method to obtain this information.

To distribute job opportunities efficiently to students and provide an industry liaison for employment and internships, the position of Horticultural Sciences Departmental Jobs/Internship Coordinator was developed. Beginning with the February 1993 issue of the *Texas A&M Horticulture Job Opportunities Newsletter*, a brief summary for all job opportunities received by the Texas A&M Univ. Dept. of Horticultural Sciences was pub-

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This project was funded by a grant from the Texas A&M University Center for Teaching Excellence. We thank Jenny A. Haley (undergraduate student, Dept. of Agricultural Education) for her technical assistance. Mention of a trademark, proprietary product, or vendor does not constitute a guarantee or warranty of the product by the authors, Texas A&M Univ., or the Texas Agricultural Experiment Station and does not imply its approval to the exclusion of other products or vendors that also may be suitable. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.

Questionnaire for Institutional Texas A&M Horticulture Job Opportunities Newsletter Recipients

Please answer the questions listed below. If you are uncertain, give your best estimate or answer unknown. All responses will remain anonymous, only tabulated data will be made public.

1. Is the horticulture unit housed as:
 - _____ A separate horticulture department or unit.
 - _____ Part of a plant science department.
 - _____ As a part of an Agriculture department, school, or college.
 - _____ Other, please specify _____
2. What degrees are granted in your department in horticultural fields of study?
 - _____ Non-degree programs.
 - _____ Associate degrees.
 - _____ B.S. or B.A. degrees.
 - _____ M.S. or M. Ag.
 - _____ Ph.D.
3. What is your average student enrollment in horticulture programs.
 - _____ Non-degree programs.
 - _____ Associate degree programs.
 - _____ B.S. or B.A. programs.
 - _____ Graduate degree programs.
4. How are issues of the Texas A&M Horticulture Job Opportunity Newsletter made available to your students?

5. How many of your students would you estimate read the Texas A&M Horticulture Job Opportunities Newsletter, for an average issue?

_____ Number?
6. Have students from your institution applied for position(s) that they became aware of through the Texas A&M Horticulture Job Opportunities Newsletter?

_____ Yes _____ No _____ Unknown

If yes, How many students? _____
7. Have student(s) from your institution been offered positions that they became aware of through the Texas A&M Horticulture Job Opportunities Newsletter?

_____ Yes _____ No _____ Unknown

If yes, How many students? _____
8. Would the majority of your students have access to the Texas A&M Horticulture Job Opportunities Newsletter if it were offered only on the internet (world-wide computer network)?

_____ Yes, our students would have access to the internet.

_____ No, our students would not have access to the internet.
9. How valuable, on a scale of 1 (no value) to 5 (very important), is the Texas A&M Horticulture Job Opportunities Newsletter to your students as a job search tool? (Please circle your choice)

1 2 3 4 5
10. List the name of the person designated to receive the newsletter for your institution and the correct mailing address so that we can verify that your institution would like to continue to receive the Texas A&M Horticulture Job Opportunities Newsletter.

Designated recipient: _____

Mailing Address: _____

11. How could the editors improve the Texas A&M Horticulture Job Opportunities Newsletter to better serve your students' needs? (Please write on the back of this form if additional space is needed)

lished. In Fall 1993, in response to requests by colleagues at other institutions, a second mailing list of universities and colleges with horticultural units located at institutions outside the Texas A&M Univ. system was developed. An initial mailing was sent to about 60 institutions accompanied by a letter explaining the publication. The response was positive; more than 40 institutions requested future copies of the newsletter for distribution among their students.

Between February 1993 and November 1995, 969 positions were listed: 83 internships, 12 nondegree positions, 149 extension positions, 65 part-time jobs, 313 bachelors degree opportunities, 102 masters degree positions, and 245 doctoral positions. While the newsletter might be deemed a subjective success, no quantitative evidence was available to determine the value of the newsletter to readers or industry members; the content had not been analyzed in terms of types of positions listed (other than degree requirements), nor was the effective readership known.

The objectives of these studies were to 1) analyze listings from past newsletters for information relating to industry segment, degree and/or experience requirements, geographic location, and starting salaries and benefits and 2) survey newsletter recipients and listing organizations to identify their characteristics and perceived value of the newsletter.

Materials and methods

Two surveys were developed to determine characteristics of the recipient institutions

Fig. 1. Questionnaire mailed to 44 horticulture departments or horticulture units housed in plant science or general agriculture units regularly receiving the Texas A&M Horticulture Job Opportunities Newsletter.

Questionnaire for Texas A&M Horticulture Job Opportunities Newsletter Recipients

Please answer the questions below. If you are uncertain, give your best estimate or answer unknown.
All responses will remain anonymous, only tabulated data will be made public.

1. Have you contacted an organization about one of their positions listed in the Texas A&M Horticulture Job Opportunities Newsletter between January 1, 1993, and December 31, 1994?
_____ Yes _____ No
2. Have you applied for a position(s) listed in the Texas A&M Horticulture Job Opportunities Newsletter between January 1, 1993, and December 31, 1994?
_____ Yes _____ No
3. Have you been offered a position(s) listed in the Texas A&M Horticulture job Opportunities Newsletter between January 1, 1993, and December 31, 1994?
_____ Yes _____ No
4. How long have you been receiving the Texas A&M Horticulture Job Opportunities Newsletter?
_____ Years _____ Months (number?)
5. How valuable to you on a scale of 1 (no value) to 5 (very important) is the Texas A&M Horticulture Job Opportunities Newsletter as a job search tool?
1 2 3 4 5
6. Would you have access to the Texas A&M Horticulture Job Opportunities Newsletter if it were offered only on the internet (world-wide computer network)?
_____ Yes, I do have access to the internet _____ No, I do not have access to the internet at this time
7. How much experience (on-the-job) do you have in the horticultural industries?
_____ Number of years _____ Number of months

Fig. 2. Questionnaire mailed to individuals regularly receiving the Texas A&M Horticulture Job Opportunities Newsletter.

(Fig. 1) and individuals (Fig. 2) of the job newsletter. A third survey (Fig. 3) was developed for a sample of 100 private-sector horticulture firms or organizations to determine the effectiveness of the newsletter as a recruiting tool. The surveys were mailed with an attached letter of explanation requesting a response within 30 days. A follow-up letter was mailed after 30 days to those individuals or organizations that had not responded.

All 749 job descriptions in the *Texas A&M Horticulture Job Opportunities Newsletter* listed between January 1993 and December 1994 were characterized and categorized. Job listings were classified based on geographic location, field of specialization, skill

and degree requirements, and remuneration. Job listings were assigned to seven geographic categories: Texas, southwestern United States (Arizona, Hawaii, California, Colorado, Oklahoma, Nevada, New Mexico, Texas, Utah), central United States (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin), southeastern United States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia), northwestern United States (Alaska, Idaho, Montana, Oregon, Washington, Wyoming), northeastern United States (Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont), and International. Note that Texas is included separately and as a part of the southwestern United States.

Positions were categorized as either private (industry) or public sector

(government, research, teaching, extension, administrative and other), by degree requirements and special skill and/or experience requirements, agricultural commodity, and starting wage or salary and benefits. Data were analyzed using the analysis of variance and frequency procedures in SAS for Windows (SAS, Cary, N.C.).

Results and discussion

More than half of the institutional recipients were classified as a portion of a plant science, agriculture, or other units (Table 1), suggesting that the readership might benefit from the inclusion of job opportunities in fields closely related to horticulture. Most offered bachelors and masters degrees and more than half offered doctorates (Table 1). Only a few institutions offered associate degrees or had nondegree programs. The average institution had 74 bachelor-degree students and 21 graduate students. Mean enrollment of nondegree (6) and associate degree (16) programs was low, but this was misleading, as most of these students were enrolled in a few institutions that offered those programs (Table 1). The most common method of circulating the newsletter to students was posting, followed by republication of the listings in another newsletter (Table 1). Despite the access of most institutions' students to the Internet, only 3% used that vehicle for circulation (Table 1). The number of hits (times that a file is accessed) recorded for the newsletter on the Aggie-Horticulture home page (<http://aggie-horticulture.tamu.edu>) on the Internet for a 4-month period (August 1995 to November 1995) reflected the low use (hits for August to November were 3, 4, 17, and 25, respectively, data courtesy R.D. Lineberger). However, there was a trend toward increased use, suggesting that this may become a more viable distribution method in the future. Half of the institutions had students that applied for listed positions; about half of those students received a job offer (Table 1). However, the average number of students applying for a position was only three per institution. Most institutions rated the newsletter as a 3 on a 1 to 5 scale (Fig. 4), with a mean value rating of 3.5.

Individual recipients of the newsletter tended to rate it higher than institutional recipients, with almost half of the individuals assigning a value

rating of 4 (Fig. 4), with a mean of 3.9. This probably reflects the composition of individual newsletter recipients, mostly former students, primarily horticulture majors, often residing in Texas (Table 1), compared to a more national distribution and diversity of majors with institutional recipients. Almost all individual recipients had some type of formal training in horticulture (Table 2). Most of the individual recipients held BS or BA degrees; whereas a significant minority also held graduate degrees (Table 2). About 10% had some sort of industry or government certification. Two-thirds of the individuals receiving the newsletter had contacted organizations regarding a listed position, over half following up with an application (Table 2). Somewhat less than half of those applying for a position received a job offer. The average recipient had 6.2 years of professional experience and had been receiving the newsletter for an average of 1.6 years. This suggests that the individual recipients were experienced professionals who might be using the newsletter as a means of monitoring the job market, rather than acquiring an entry-level position following graduation.

Responding firms listed an average of 1.8 positions during the 2-year period. Of responding private-sector firms, 85% had received one or more applicants (mean of 4.2) as a result of a job listing, and 46% of the firms had interviewed one or more applicants. However, only 17% of the responding firms hired an employee as a result of a newsletter listing. This rather low percentage of hiring resulting from the newsletter might account for the moderate mean rating (3.5) and wider distribution of ratings assigned to the newsletter by listing organizations than that assigned by prospective employees (Fig. 4).

Texas-based positions accounted for 41% overall and greater than half of the part-time, extension, and BS or BA positions (Table 3). Doctoral and internship positions were the most evenly distributed geographically. Southeastern and southwestern states accounted for nearly three quarters of the listings for all but positions requiring graduate degrees (Table 3). The fewest positions originated from the northwestern United States and international locations (Table 3).

In the private sector, customer-

Questionnaire for Organizations Listing Positions in the Texas A&M Horticulture Job Opportunity Newsletter

Please answer the questions below. If you are uncertain, give your best estimate or mark "unknown". All responses will remain anonymous, only tabulated data will be made public.

1. How many positions did your organization list between January 1, 1993, and December 31, 1994, in the Texas A&M Horticulture Job Opportunities Newsletter?
 _____ Positions listed (Number ?)
2. Did your listing(s) in the Texas A&M Horticulture Job Opportunities Newsletter generate any applications or contacts regarding your position(s)?
 _____ Yes _____ No _____ Unknown
3. How many applicants would you estimate were generated as a result of your listing(s) in the Texas A&M Horticulture Job Opportunities Newsletter?
 _____ Applicants (Number ?)
4. Did your organization interview a candidate(s) generated by your listing in the Texas A&M Horticulture Job Opportunities Newsletter?
 _____ Yes _____ No _____ Unknown
5. Did your organization hire a person(s) for the position(s) who contacted your organization as a result of your listing(s) in the Texas A&M Horticulture Job Opportunities Newsletter?
 _____ Yes _____ No _____ Unknown
6. How valuable on a scale of 1 (no value) to 5 (very important to personnel recruitment) is the Texas A&M Horticulture Job Opportunities Newsletter as a personnel recruitment tool for your organization? (Please circle your choice)
 1 2 3 4 5
7. What are the fields of horticulture in which your organization is engaged?

service positions constituted the greatest proportion of job listings, regardless of the educational requirements (Table 4). Surprisingly, management positions and those with primarily sales responsibilities did not exceed 23% of the listed positions (Table 4). Dayberry and Dillingham (1992), in a survey of agricultural graduates of Southwest Texas State Univ., found fewer sales positions than indicated in nationwide data. Research-related positions were the most commonly listed public-sector jobs, followed closely by extension service listings (Table 4). Almost all horticulture teaching positions required a doctoral degree (Table 4).

Only 2% of the positions listed from January 1993 to December 1994 did not require at least some general horticultural knowledge (Table 5). Across degree requirements, green industry (ornamentals) disciplines constituted three of the top four categories, primarily due to a large demand for BS or BA graduates, interns, and

Fig. 3. Questionnaire mailed to a sample of 100 private-sector horticultural firms or organizations listing positions in the Texas A&M Horticulture Job Opportunities Newsletter between January 1993 and December 1994. Public-sector organizations were excluded from the survey.

part-time help from these disciplines (Table 5). Agricultural engineering and agricultural economics degrees with a horticultural emphasis, socio-horticulture, and postharvest positions did not exceed 5% of the positions listed in any degree requirement group (Table 5). While this could reflect a small number of available jobs for these graduates, the lack of listings in these disciplines may be due to more specialized recruitment for these positions that does not include university horticulture unit involvement.

Table 1. Survey results of institutional recipients of the *Texas A&M Horticulture Job Opportunities Newsletter*. Of 44 institutions, 36 (82%) responded to the survey.

Institutional information	Institutions represented (% responding yes)
Institutional location	
Separate Horticulture Unit	44
Within	
Plant Science	17
Agriculture Unit	39
Other	11
Degrees offered	
Nondegree programs	8
Associate degrees	14
BS degrees	92
MS/MAgr.	81
PhD	64
Circulation method for newsletter	
Posted	86
Hand circulation	3
Republished	19
Telecommunications	3
Other	19
Student access to Internet	56
Application information	
One or more students applying	50
One or more students receiving offers	22

Mean annual starting salaries increased with greater educational requirements (Table 6). While no hourly positions were listed for advanced degrees, salaried BS or BA positions started at a mean of \$23,453/year compared to an average of \$16,495/year for hourly positions (based on a

40-hour work week). Starting salaries for BS or BA positions listed were comparable to the 1993-94 nationwide starting salaries for supervisors and managers in wholesale and retail nurseries and landscape firms (Geistlinger, 1994b; Schäfer and Siatt, 1995b). The differences in starting

salaries for BS- or BA-requiring positions and those requiring an MS or Masters of Agriculture averaged \$5,020/year (Table 6). Doctoral positions commanded even greater starting salaries, about \$15,145/year over an MS or Masters of Agriculture position and \$20,165/year over a BS or BA position (Table 6). Doctoral position salaries were comparable to mean salaries reported by Ingram (1995) for assistant professors in a survey of horticulture departments in the southern United States.

Less than one-third of the employers specifically listed fringe benefits as a part of the compensation package (Table 6). This was similar to 1993-94 nursery/landscape industry survey results (Geistlinger, 1994a; Schäfer and Siatt, 1995a). Extension positions, which are predominantly federally funded, and those requiring advanced degrees may not have listed fringe benefits specifically since they often are assumed to possess them.

Despite the emphasis placed by academia on earning high grades, <10% of the positions of any degree requirement category had a minimum grade point request above that required for graduation (Table 6). Likewise, requests for completion of government or industry certification programs were equally low (Table 6). The two most frequently requested and/or required additional skills were foreign language skills, followed by previous work experience (Table 6). Smalley (1993) reported that communication skills and internships were rated among the most important curriculum components in a delphi survey of horticulture industry experts. Bekkum (1993), in a survey of human resource managers of agricultural firms, found coop programs were preferred over internships. More than half of all advanced degree and over one-third of all BS or BA listings indicated a preference for individuals with foreign language skills (Table 6). Spanish was the most fre-

Fig. 4. Distribution of perceived value ratings of the *Texas A&M Horticulture Job Opportunities Newsletter* as a recruiting tool for firms or organizations listing positions and as a job search tool by individuals and educational institutions receiving the newsletter. 1 = no value, 5 = very important to personnel recruitment or as a job search tool.

Table 2. Survey results of individuals receiving the *Texas A&M Horticulture Job Opportunities Newsletter*. Of 52 individuals, 35 (67%) responded to the survey.

Survey topic	Individuals represented (%)
Contacting firm/organization	66
Applied for one or more listings	46
Offered one or more positions	20
Access to internet	20
With formal training	97
Type of training:	
Industry certification program	9
Government certification program	11
High school/vocational	3
BS/BA	86
MS/MAgr	14
PhD	11
Former TAMU student	69
Of former students, those with horticulture majors	80

quently requested foreign language, but international positions requested other languages such as Russian and Mandarin. Spanish proficiency was requested most frequently for positions in southern and western states, but not exclusively so. This would suggest that foreign language and internship re-

quirements should be incorporated into undergraduate and graduate horticulture curricula. Fails (1995) indicated that internship programs were very effective mechanisms for matching prospective employers and employees. The mean hourly wage rates for interns in our study were on the

low end of the range indicated by Fails (1995), perhaps a reflection of regional wage differences.

Our results suggest that the newsletter is of moderate to high value to all three groups surveyed. However, the development of regional listing services or a newsletter with national scope would be desirable for institutions and individuals outside the state of Texas. Traditional industry recruitment techniques, such as newspaper classified ads, trade journal listings, word-of-mouth advertising, and internship directories (American Association of Botanical Gardens and Arboreta, 1996) have been adequate in the past. As competition for qualified employees becomes more acute, more widely based search techniques will be needed. Recently, two horticulture employment publications with national scope have been launched: *Hort-Opportunities* (ASHS) and *Ferrell's Jobs in Horticulture* (Jack Ferrell, Carlisle, Pa.). However, the latter is limited primarily to turf and ornamental career opportunities and *HortOpportunities* is more slanted to positions requiring advanced degrees.

The need exists for a coordinating

Table 3. Geographical distribution (%) of jobs listed (749) in the *Texas A&M Horticulture Job Opportunities Newsletter* from 1 Jan. 1993 through 31 Dec. 1994.

Job type	Regional distribution						
	Texas	Northwest	Northeast	Southwest ²	Southeast	Central	International
All jobs (%)	41	4	9	53	20	10	4
Part-time	90	0	0	96	2	2	0
Internships	35	2	32	38	17	6	5
BS/BA	65	4	4	74	11	5	2
Extension listings	59	3	4	64	27	2	0
MS/MAgr.	20	4	6	42	21	25	4
PhD	6	5	12	25	33	17	8

²Includes those listings located in Texas.

Table 4. Professional distribution (%) of jobs listed (749) in the *Texas A&M Horticulture Job Opportunities Newsletter* from 1 Jan. 1993 through 31 Dec. 1994. Note that totals may not sum to 100% as some jobs were in more than one category.

Degree requirement	Industry (private sector)			Government/public sector				
	Sales	Management	Service	Research	Teaching	Extension	Administration	Other
All jobs	4	7	30	29	13	23	6	8
Part-time	2	0	37	21	0	0	0	59
Internships	11	23	44	17	2	2	0	23
BS/BA	10	13	57	22	2	2	<1	3
Extension	0	0	0	0	0	100	0	0
MS/MAgr.	1	6	33	41	4	25	2	0
PhD	0	1	3	54	42	23	19	2

Table 5. Distribution of jobs (749) within horticulture and related disciplines listed in the *Texas A&M Horticulture Job Opportunities Newsletter* from 1 Jan. 1993 through 31 Dec. 1994. Note that totals do not sum to 100% as some jobs were in more than one category^z of activity.

Degree requirement	GH	F	V	P	NGC	G	SH	L	PE	AEng	AEcon
All jobs	98	9	13	2	12	17	1	28	8	<1	2
Part-time	74	0	0	0	6	12	0	51	4	0	0
Internships	94	3	12	2	32	32	3	29	2	0	3
BS/BA	99	3	7	1	16	24	1	33	6	0	1
Extension	100	14	22	0	11	7	0	31	12	1	4
MS/MAgr.	100	19	20	5	5	17	0	11	17	0	4
PhD	99	14	16	2	5	11	0	21	10	<1	1

^zGH = general horticulture, F = fruit, V = vegetables, P = postharvest, NGC = nursery/garden center, G = greenhouse, SH = sociohorticulture, L = landscape, PE = pathology/entomology, AEng = agricultural engineering, AEcon = agricultural economics.

Table 6. Fringe benefits and special requirements/preferred skills of jobs (749) listed in the *Texas A&M Horticulture Job Opportunities Newsletter* from January 1993 through December 1994.

Degree requirement	Mean hourly pay rate (\$) ^z	Mean annual salary (\$) ^z	Offers fringe benefits (%)	Govt./industry certification requirement (%)	Previous work experience (%)	Foreign language skills (%)	Minimum grade point requirement (%)	Other special skills (%)
All jobs	---	---	26	3	19	45	5	4
Part-time	5.83	2400	8	0	4	12	2	0
Internships	6.06	6,662	23	0	2	9	2	17
BS/BA	7.93	23,453	32	6	11	36	9	1
Extension	---	24,696	15	1	72	82	3	13
MS/MAgr.	---	28,473	33	4	23	49	4	0
PhD	---	43,618	27	0	10	56	5	1

^zNote that positions listing only hourly rates were not included in mean annual salary calculations and positions listing only monthly or annual salaries were not included in mean hourly rate calculations.

body for a national cross-commodity employment service/publication for BS or BA and associate-degree-requiring positions in horticulture and related disciplines. This may be one of the best services that ASHS could offer to foster industry involvement and benefit students and professionals simultaneously. Any such undertaking would require a close involvement with existing national, regional, and perhaps state commodity trade organizations. Collection of listings from various universities and industry organizations, subsequent forwarding to a central location, and publishing and distribution time may result in out-of-date information. Costs of printing and distributing paper copies of a newsletter would exceed that of electronic distribution. Use of Internet technologies, such as linking to interactive databases like Online Internships for Horticulture (<http://hortwww.2.ag.ohio-state.edu/hvp/ed/interns.html>) or Career Network (<http://www.plants.org/career-network/search.html>), may allow a more

timely collection and distribution of available positions. This would provide a mechanism for continuous updating of employment information with minimum time lag and distribution costs. Consolidation of existing regional newsletters into a more comprehensive interactive national/international listing service would reduce pressures on departmental budgets, while expanding students' opportunities and reaching a larger readership for industry.

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