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Designing Inservice Computer Training Based on Extension Personnel's Job Position

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지도교육자의 직무에 따른 컴퓨터 연수 프로그램 설계 타당성

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국 문 요 약

본 연구의 목적은 지도교육자의 직무가 컴퓨터 경험, 지식, 태도, 사용에 미치는 영향을 구명한 후 지도 교육 시스템에서 컴퓨터 연수 프로그램을 직무에 따라서 그룹화하여 실시하는 것이 적절한 방법인지 그 타당성을 조사하는데 두고 있다. 연구방법은 중다변인변량분석(MANOVA)에 의해 이루어졌다. 연구 결과에 의하면 이들간에는 통계적으로 유의한 관계성이 있다고 나타나며, 따라서 컴퓨터 연수 프로그램을 설계시 직무는 고려해야 할 중요 변인으로 여겨진다. 한편 직무에 따른 참가자들의 그룹화는 쉽게 이루어 질 수 있으므로 실질적인 측면에서도 설계자들이 고려해야 할 요인으로 여겨진다.

Educators of today are living in the transition between the information age and the computer or communication age. One area greatly influenced by this transition to the communication age is Extension. Ezell (1989) contended that Extension's future depends on its ability to interpret trends and use technology to deliver programs and teach problem solving as people leave the information age and enter the communication age. Thus, the teaching methods and communicating approaches Extension adopted in the past need to be updated for today's diverse and quickly changing society in this age (FACT Committee, 1991). Extension needs to put more effort toward computerizing its system and toward increasing the computer literacy of its personnel (Taylor et al., 1991).

Every Extension service has its own inservice computer training programs to keep its personnel updated with new scientific technology. Information on the relationship between job position of Extension personnel and the selected variables related to computer technology would help in the design and implementation of computer training and support programs. Yet little attention has been paid to job position in the design of computer training programs, and little research was conducted to identify its relationships with computer experience, knowledge, attitude and use.

Purpose and Objective

The main purpose of this study was to assess the effect of Extension personnel's job position on the selected variables related to computer technology and to provide the implications for designing inservice computer training programs in Extension. This study was designed to fulfill the following objectives.

1. To investigate the relationship between job position and computer experience.

2. To investigate the relationship between job position and computer knowledge.

3. To investigate the relationship between job position and computer attitude.

4. To investigate the relationship between job position and computer use.

To meet the objectives listed above, the following hypotheses were tested:

Ho_1: There is no significant difference in responses on computer experiences in a multivariate analytic sense when grouped by Extension personnel's job position.

Ho_2: There is no significant difference in responses on computer knowledge in a multivariate analytic sense when grouped by Extension personnel's job position.

Ho_3: There is no significant difference in responses on computer attitude in a multivariate analytic sense when grouped by Extension personnel's job position.

Ho_4: There is no significant difference in responses on computer use in a multivariate analytic sense when grouped by Extension personnel's job position.

Procedures

The population for this study consisted of all Extension personnel listed in the Iowa State University Extension Directory. It included personnel from Continuing Education, and Extension to Business and Industry as well as Cooperative Extension. The total population numbered 974, and 200 sample subjects were selected by simple random sampling method. Two follow-up mailings were made, and the final response rate was 95 percent. No difference was found between early and late respondents after utilizing simple t-tests.

The questionnaire consisted of Computer Attitude Part, Computer Experience Part, Computer Knowledge Part, Computer Use Part, and Demographic Information Part. The questions in Computer Attitude Part were originally adapted from the Computer Attitude Scales developed by Loyd and Gressard (1986). Woodrow (1991) argued that this scale is the most extensively used and tested among educational researchers. Twenty-two items were extracted from the scales after deleting items with low factor loading scores; two items were added to the computer usefulness sub-scale.

In its original form, the scale was composed of four sub-scale: computer anxiety, computer confidence, computer enjoyment, and computer usefulness. Each sub-scale contained ten items. This scale was a Likert-type instrument ranging from strongly disagree (1) to strongly agree (5). The Cronbach's alpha reliability coefficient was. 94.

Two items were employed to identify Extension personnel's computer experience: computer training courses participated in and years of computer use. Computer knowledge was measured in terms of self-reported ability to use specific computer systems and programs. For this part, a five point Likert-type scale was used as follows: 1 = very poor; 2 = poor; 3 = average; 4 = good; and 5 = excellent. The alpha coefficient for reliability was .86.

In the computer use part, three items were administered in terms of frequency, time length, and how often E-mail and Iowa State University Extension Compute Network (EXNET) used. Content validity of the instrument was established by review three Extension computer specialists and two faculty members in the Department of Agricultural Education and Studies in Iowa State University.

Data analysis consisted of calculating means and standard deviations, and determining statistical differences through the use of t-tests and one way analysis of variance. Multivariate analysis of variance (MANOVA) was used to test the hypothesis.

Results

The job position distribution consisted of 25 county Extension education directors (13.8%), 38 field specialists (20.9 %), 23 state specialists (12.7 %), 10 administrators (3.9%), 47 office workers (26.0%), 12 program assistant (6.6%), 11 support staff (6.1%), and 15 others (8.3%). The total subjects who participated in the study were 184.

The testing of Hypothesis 1 dealing with relationship between job position and computer experience was accomplished by multivariate analysis of variance (MANOVA). Wilk's Lambda was used to test overall job position effect on computer experience. Wilk's Lambda of computer experience items from MANOVA was 0.7125, F (42, 137) = 4.2490 and p = .0001. Therefore, an

〈Table 1〉 Analysis of variance of means of computer experience items by job position

No	Item	1[a]	2[b]	3[c]	4[d]	5[e]	6[f]	7[g]	8[h]	F value	F-prob
1.	Number of Workshops and courses participated in	3.96	3.61	5.64	7.60	6.47	3.20	2.17	4.78	3.57*	.0013
2.	Number of years of use	7.27	6.42	10.00	17.3	7.56	7.79	3.83	9.63	6.28**	.0001

[a] County Extension Education Director
[b] Field Specialist
[c] State Specialist
[d] Administrator
[e] Office Worker
[f] Other
[g] Program Assistant
[h] Support Staff

* Significant, P< = .05.
** Highly significant, p= .01. 2. d>a, b, e, f, g.

〈Table 2〉 Analysis of variance of means of computer knowledge items by job position

No	Item	1[a]	2[b]	3[c]	4[d]	5[e]	6[f]	7[g]	8[h]	F Value	F-prob
1.	Computer systems	3.16	3.21	3.61	3.90	3.65	3.33	2.67	3.45	2.44*	.0210
2.	Wordprocessing	3.56	3.87	4.17	4.20	4.19	4.00	3.25	3.82	3.21**	.0032
3.	Spreadsheet	2.76	2.76	3.48	3.70	2.83	3.13	2.00	3.36	3.90**	.0006
4.	Graphic	2.12	2.47	3.13	3.20	2.45	2.60	1.75	3.36	3.47**	.0017
5.	Statistical	2.20	2.16	2.91	2.70	2.33	2.33	1.67	2.64	2.05	.0512
6.	Communication	3.08	3.11	3.61	3.20	3.47	2.73	1.73	3.45	5.07**	.0001
7.	Language	2.32	1.87	2.61	2.90	2.79	1.87	2.08	2.18	3.71**	.0009

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* Significant, P< = .05. 3. c, d>g 6. b, c, e, h>g 7. e>b.
** Highly significant, p= .01. 2. d>a, b, e, f, g.

overall significant difference was found toward computer experience items according to Extension personnel's job position. Each item's results from the univariate analysis of variance is shown in Table 1.

Wilk's Lambda of computer knowledge items form MANOVA to test Hypothesis 2 was 0.5469, F (49, 129) = 2.1689 and p = .0001. Therefore, an overall significant difference was found toward computer knowledge items according to Extension personnel's job position. From the univariate analysis of variance, all items were significant at alpha = .05 except item 5, *statistical programs.* The results from the univariate analysis are included in Table 2.

Wilk's Lambda of computer attitudes from

〈Table 3〉 Analysis of variance of means of computer experience items by job position

No	Item	1[a]	2[b]	3[c]	4[d]	5[e]	6[f]	7[g]	8[h]	F Value	F-prob
1.	Make me feel uncomfortable (CA)	4.32	4.32	4.48	4.60	4.13	4.27	3.83	3.73	1.87	.0776
2.	Confident about trying new (CC)	3.72	3.76	4.13	4.30	3.96	4.00	3.42	3.91	1.08	.3794
3.	I find it hard to stop (CE)	3.20	3.68	3.57	4.20	3.81	3.93	3.42	3.00	2.41*	.0222
4.	Computer is worth while (CU)	4.44	4.50	4.61	4.60	4.49	4.67	4.67	4.64	0.36	.9231
5.	Do not feel threatened (CA)	3.68	3.84	4.17	4.30	3.83	3.93	3.33	4.00	1.39	.2114
6.	Computer is very hard for me (CC)	4.08	4.18	4.17	4.50	4.32	4.40	3.67	4.09	1.27	.2694
7.	Is enjoyable and stimulating (CE)	3.64	3.97	3.67	4.40	4.28	4.13	3.75	3.36	3.15**	.0037
8.	Need a firm mastery (CU)	4.28	4.24	4.04	4.50	4.06	4.27	2.92	3.82	4.25**	.0002
9.	Get a sinking feeling (CA)	4.36	4.50	4.61	4.50	4.40	4.33	4.17	4.09	0.98	.4454
10.	Not the type to do well (CC)	4.04	4.39	4.57	4.50	4.34	4.33	4.08	4.18	1.07	.3857
11.	I stick with it until (CE)	3.08	3.50	3.61	3.90	3.83	3.33	3.25	3.18	2.09*	.0474
12.	Expect me to be literate (CU)	3.64	3.68	4.22	4.10	3.74	3.47	2.83	3.91	2.58*	.0149
13.	Computer makers me nervous (CA)	4.16	4.29	4.52	4.70	4.13	4.33	3.75	3.82	2.00	.0570
14.	I can work with computers (CC)	4.40	4.39	4.70	4.60	4.32	4.47	4.08	2.82	1.89	.0743
15.	Does not appeal to me (CE)	2.88	3.47	3.96	4.10	3.66	3.33	3.25	4.36	3.30**	.0025
16.	Use computers in my career (CU)	4.64	4.63	4.61	4.40	4.53	4.73	4.50	4.18	0.31	.9471
17.	Does not bother me at all (CA)	3.88	4.18	4.17	4.30	4.21	4.27	4.25	3.82	0.47	.8571
18.	Not good with computers (CC)	3.80	4.16	4.22	4.60	4.34	4.00	3.92	4.55	1.32	.2455
19.	As little work with computers (CE)	4.24	4.61	4.43	4.50	4.40	4.27	4.00	4.27	1.11	.3601
20.	Increases job possibilities (CU)	4.44	4.53	4.35	4.40	4.64	4.60	4.33	4.27	0.79	.6004
21.	Feel aggressive and hostile (CA)	4.52	4.32	4.61	4.60	4.43	4.27	4.42	4.55	0.51	.8018
22.	Perform well in workshops (CC)	3.56	3.97	4.13	4.40	3.83	3.67	3.42	3.64	2.09*	.0472
23.	Continue to think about it (CE)	3.48	3.71	4.31	3.70	4.02	3.67	3.50	4.00	2.48*	.0188
24.	Supervisor expects me to be (CU)	4.56	4.34	4.35	4.00	4.32	3.80	3.08	3.73	4.91**	.0001

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** Highly significant, p = .01.
Categories : CA = Computer anxiety; CC = Computer confidence; CE = Computer enjoyment; CU = Computer usefulness

MANOVA was 0.1945, F(168, 12) = 1.6731 and p = .0001. Therefore, an overall significant difference was found toward computer attitude items when grouped by Extension personnel's job position. According to the univariate analysis of variance (see Table 3), items 3, 7, 8, 11, 12, 15, 22, 23, and 24 were significant at alpha = .05

To test last hypothesis, Wilk's Lambda was also adopted. Wilk's Lambda of computer use items from MANOVA was 0.7091, F (21, 158) = 2.9597 and p = .0001. Therefore, an overall significant difference was found toward computer use items according to Extension personnel's job position. The results from the univariate analysis (see Table 4) showed that all items were significant at alpha = .05.

〈Table 4〉 Analysis of variance of means of computer use items by job position

No	Item	1[a]	2[b]	3[c]	4[d]	5[e]	6[f]	7[g]	8[h]	F Value	F-prob
1.	Frequency	4.20	4.39	4.87	4.80	4.66	3.93	3.50	4.36	3.76**	.0008
2.	Length	3.64	4.00	4.35	4.40	4.30	4.26	3.42	4.40	2.83**	.0082
3.	E-mail and EXNET	3.20	3.71	4.17	4.20	3.87	2.80	1.25	3.09	6.33**	.0001

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** Highly significant, p=.01. 1. c>g 3. c>g; d>g; e>g; b>g.

Conclusion and Recommendation

Based on the results from this study, Extension personnel's job position has significant relationships with selected variables related to computer technology such as computer experience, computer knowledge, computer attitude, and computer use. Thus, identification of Extension personnel's job position is important before the design and implementation of computer training programs.

Different computer experience, knowledge, attitude, and use level may need different teaching methods and subjects in the training programs. Individuals whose experience level and knowledge level higher than average people may be not interested in basic introduction to computer systems and programs. Therefore, they should be grouped together and educated differently. Easy way to group potential participants of training programs is the consideration of their job position.

Since this could be generalizable to only Iowa State University Extension Service, more studies should be conducted to determine job position's effect on computer experience, knowledge, attitude, and use in other States. Further, it is recommended that outcomes of computer training programs be evaluated when grouped by the job position.

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