

INFORMATION TECHNOLOGY CERTIFIED COMPUTER PROFESSIONAL CERTIFICATION: SHOULD FOUR-YEAR INSTITUTIONS EMBRACE IT?

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This research surveyed 353 information technology professionals with certification from the Institute of Certified Computing Professionals to determine if universities should develop curricula and/or teach to information technology certifications. This survey also ascertained how these professionals preferred to study for the certification examination. Eighty-six (24%) responses yielded results indicating that these professionals preferred to study for the examination on their own or use a one-time preparatory course. Regardless of the length of time the certification was held, the respondents felt that it was not important for universities to design curricula for, or teach to, certifications.

Four-year bachelor degree granting institutions have traditionally left the teaching of information technology (IT) certifications to private training institutions, community colleges, or technical schools. Many educators in four-year institutions are not familiar with, nor do they care to become familiar with, IT certifications (Mason, 2003). However, appearing on the market are non-vendor specific professional certifications emphasizing both a business and IT core. This business core requirement moves the certification from pure training to a more academic environment (Nelson & Rice, 2001), yet four-year bachelor degree granting institutions still shy away from teaching to a certification. In 1999, the tide began to turn as several four-year institutions started offering certifications. However, many of these institutions were technical in nature, such as the New York Institute of Technology (Cole-Gomolski, 1999). What is needed is a certification indicating that IT professionals speak the business office's language (Lee, 2003). The Institute for Certification of Computing Professionals (ICCP) offers two such certifications: the Associate Computing Professional (ACP), designed for the entry level student; and the Certified Computing Professional (CCP), designed for computer professionals with three or more years' experience. The questions answered by this research study were:

R₁ Is it important to address certifications in a four-year institution?

R₂ How do IT professionals receive the knowledge to obtain the certification?

REVIEW OF RELATED LITERATURE

As far back as 1993, it was recognized that the skill mix for many IT professionals was heavily weighted towards technical expertise, yet many organizations favored IT professionals with a business background (Trauth, Farwell, & Lee, 1993). In 1995, Lee, Trauth, and Farwell stated "...the requirements for IS professionals are becoming more demanding in multiple dimensions" and that there are "...some clear patterns in IS staffing and activity trends that point to the shift in emphasis from a traditional, central IS organization toward a more decentralized, end-user-focused business orientation" (p. 332). Even in today's market, vendor-specific certifications are less of a priority. Organizations are looking for IT professionals with an understanding of how a business works and

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how technology fits within the business context (McGee, 2003).

The IT field continues to evolve. This evolution brings about significant challenges to educators because of its changing impact on IT and other organizational processes. As educators we are constantly required to stay current on emerging technologies. We must identify the trends, technologies, systems, and knowledge needed by industry (Davis, 2003). Professional institutions which offer certifications keep abreast of what is needed in industry and tailor their core competencies to address these needs.

METHODOLOGY

The questions answered by this investigation were:

R₁ Is it important to address certifications in a four-year institution?

R₂ How do IT professionals receive the knowledge to obtain the certification?

These questions were answered by a researcher-developed survey. In their article on determining sample size Bartlett, Kotrlik, and Higgins (2001) included a table for determining minimum required sample sizes based on mathematical formulas, using a margin of error of .03, an alpha of .05, and a *t* of 1.96. Using Bartlett et al.'s (2001) table, the minimum required responses for a sample size drawn from a population of 300 was 84. To ensure a representative return rate, this research study involved the selection of a random sample of managers from a list of 354 information systems management professionals, of which 86 (24%) responded. The survey method to collect data was chosen over the interview method due to the geographic distribution of the population.

Using the Likert-type scale of 1 (Strongly Disagree) to 5 (Strongly Agree), operational definitions, and directions, I created a draft survey (as a pilot) for distribution to six Office Information Systems faculty from Bloomsburg University in Pennsylvania. A neutral response was not included in order to derive a more

accurate response from the population. The pilot survey was analyzed to identify errors in form or presentation and to identify shortcomings within the statements. Minor flaws in statements and presentation were found. The survey was changed to address these issues and then re-administered to the pilot survey committee for additional comments. Upon finishing the survey, the committee members were interviewed individually to ascertain their reactions and comments.

Content validity was conducted by members of the Institute for the Certification of Computing Professionals (ICCP) governance group using a modified Delphi technique. The questionnaire was submitted to the group for comments. After review, changes in grammar and format were made and the survey resubmitted. The survey changes were accepted and the survey deemed valid when all group members came to consensus.

In the reliability phase, a computation of Cronbach's Alpha was performed. The initial reliability was .3253. After removing specific statements identified by the Alpha results, reliability for the final questionnaire became .7766. The individual scale-item statistics confirmed this finding of a high degree of internal consistency, with all items exhibiting a positive Corrected Item-Total Correlation. Because deleting any other items would have no significant effect on the overall scale reliability, the rest of the items were justified for retention.

I conducted the survey through a website-driven form with the data going to an Access database. The database results were exported to an Excel spreadsheet. The raw spreadsheet data were then migrated to SPSS for analysis.

As the data from each survey statement was considered a variable, this research study began the analysis with univariate statistics. Initially, I used frequency and percentage tables to evaluate the distribution of responses. The data collected were considered to be an interval scale as the interval between scale points was equal. As such, the descriptive statistics included the mean, median, and mode. The spread identified the standard deviation, range, maximum, and minimum. The shape identified skewness and kurtosis. This study assumed a 95% confidence

level to ensure a valid degree of reliability. Correlation analysis was also performed on the five non-demographic statements dealing with certification.

RESULTS

POPULATION DEMOGRAPHICS

This investigation was interested in the number of years the respondents had held certifications, as well as how many were employed in the IT field and the types of certifications held. The survey defined the number of years certified in the following manner: 0 to 3 years, 4 to 8 years, 9 to 15 years, 16 to 20 years, and over 20 years. Of the 87 respondents, 3% had held certifications for less than 3 years, 9% had held certifications from 4 to 8 years, and 88% held certifications over 8 years. See Table 1.

Of interest in this study was the analysis of whether there was a difference between the newer certified respondents and those who held certifications over nine years regarding whether the certification helped in obtaining a job and/or helped in their current job. Using a scale of 1 (Strongly Disagree) to 5 (Strongly Agree), the newer certified respondents indicated that the certification helped in their jobs ($\bar{M} = 4.000$), whereas the respondents holding the certification over 20 years determined the certification was not as much help ($\bar{M} = 3.185$). It was interesting to note that the certification was more help in obtaining a job for the respondents who had held certifications for over 20 years than for those respondents who had held certifications under 3 years (Table 2).

Eighty-six percent of the respondents continued to work in the field, while 14% no longer worked in the field. Eighty-seven percent of the respondents held the Certified Computer Professional (CCP) certification. Twelve percent held the Certified Data Management Professional (CDMP) certification, while only 1% held the Associate Computer Professional (ACP) certification. Twenty-nine percent of the respondents held other professional certifications, as well.

Table 1. Years of Certification

Years of Certification	% Respondents
0-3	3%
4-8	9%
9-15	26%
16 - 20	30%
Over 20	31%

Table 2. Help in Employment

Years of Certification	Help in current employment (\bar{M})	Help in obtaining employment (\bar{M})
0-3	4.000	3.000
4-8	4.000	4.125
9-15	3.043	3.696
16 - 20	3.192	3.346
Over 20	3.185	4.074

ANALYSIS

The final survey instrument consisted of nine questions and statements, of which the first four were demographics. Statements five through nine ascertained the respondent's preference for preparing for the certification exam and whether universities should address the core competencies of certification. These five statements used a scale of 1 (Strongly Disagree); 2 (Disagree); 3 (Partially Disagree); 4 (Agree); and 5 (Strongly Agree). See Appendix A. In general, respondents indicated that it was not important for universities to address ICCP (ADDICCP) or certifications in general (ADDCERT). The respondents indicated they much preferred to study on their own (STUDYOWN) or take a one time examination preparatory class (PREPCRSE). See Table 3.

An analysis of the final five statements follows:

Statement 5 was about the importance of having curriculum designed to address ICCP professional certification core competencies in a four-year institution. All respondents were in agreement that it was not important for four-year

institutions to have curriculum designed to address ICCP core competencies. See Table 4.

Statement 6 was about the importance of addressing professional certifications in general. All respondents were in agreement that it was not important for four-year institutions to address professional certifications in general. See Table 5.

Statement 7 was about the importance of four-year institutions addressing ICCP professional certifications in particular. All respondents were in agreement that it was not important for four-year institutions to address ICCP professional certifications in particular. See Table 6.

Statement 8 was about the preference to study for the ICCP professional certification exam on their own. All respondents were in agreement that, for the most part, they would prefer to study for the certification examination on their own. See Table 7.

Statement 9 was about the preference to study for the ICCP professional certification in a one-time exam preparatory course. All respondents were in agreement that, for the most part, they would prefer to study for the certification exam in a one-time exam preparation course. See Table 8.

The responses were relatively close through all “length of time certified” groups on each of the five statements.

CORRELATION ANALYSIS

All five statements indicated a positive Pearson Correlation, significant to the .01 level (two-tailed). See Appendix B. The analysis of the correlated statements follows:

Table 3. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	
CURRICUL	86	1	4	2.6744	0.9132	Disagree
ADDCERT	86	1	4	2.593	0.84544	Disagree
ADDICCP	86	1	4	2.4186	0.74305	Disagree
STUDYOWN	86	2	5	3.4767	0.68129	Partially Disagree
PREPCRSE	86	2	5	3.4767	0.68129	Partially Disagree
Valid N (listwise)	86					

Statement 5: It is important to have curriculum designed to address ICCP professional certification core competencies in a four-year institution and Statement 6: It is important for four-year institutions to address professional certifications in general indicated a positive correlation ($r = .924$).

Statement 5: It is important to have curriculum designed to address ICCP professional certification core competencies in a four-year

Table 4. Address ICCP Certification

Years of Certification	It is important to have curriculum designed to address ICCP professional certification core competencies in a four-year institution.	
0-3	$\underline{M} = 2.000$	Disagree
4-8	$\underline{M} = 2.750$	Disagree
9-15	$\underline{M} = 2.217$	Disagree
16 - 20	$\underline{M} = 2.346$	Disagree
Over 20	$\underline{M} = 2.481$	Disagree

Table 5. Certification in General

Years of Certification	It is important for four-year institutions to address professional certifications in general.	
0-3	$\underline{M} = 2.670$	Disagree
4 - 8	$\underline{M} = 2.875$	Disagree
9 - 15	$\underline{M} = 2.478$	Disagree
16 - 20	$\underline{M} = 2.400$	Disagree
Over 20	$\underline{M} = 2.778$	Disagree

Table 6. Address ICCP in Particular

Years of Certification	It is important for four-year institutions to address ICCP professional certifications in particular.	
0-3	$\underline{M} = 2.330$	Disagree
4 - 8	$\underline{M} = 2.875$	Disagree
9 - 15	$\underline{M} = 2.391$	Disagree
16 - 20	$\underline{M} = 2.280$	Disagree
Over 20	$\underline{M} = 2.444$	Disagree

Table 7. Study On My Own

Years of Certification	I would prefer to study for the ICCP professional certification exam on my own.	
0-3	$\underline{M} = 3.670$	Partially Disagree
4-8	$\underline{M} = 3.625$	Partially Disagree
9-15	$\underline{M} = 3.522$	Partially Disagree
16-20	$\underline{M} = 3.560$	Partially Disagree
Over 20	$\underline{M} = 3.296$	Partially Disagree

Table 8. Exam Prep Course

Years of Certification	I would prefer to study for the ICCP professional certification in a one-time exam preparatory course.	
0-3	$\underline{M} = 3.670$	Partially Disagree
4-8	$\underline{M} = 3.625$	Partially Disagree
9-15	$\underline{M} = 3.522$	Partially Disagree
16-20	$\underline{M} = 3.560$	Partially Disagree
Over 20	$\underline{M} = 3.296$	Partially Disagree

institution and Statement 7: It is important for four-year institutions to address ICCP professional certifications in particular indicated a positive correlation ($r = .689$).

Statement 6: It is important for four-year institutions to address professional certifications in general and Statement 7: It is important for four-year institutions to address ICCP professional certifications in particular indicated a positive correlation ($r = .780$).

Statement 8: I would prefer to study for the ICCP professional certification exam on my own and Statement 9: I would prefer to study for the ICCP professional certification in a one-time exam preparatory course indicated a perfect positive correlation ($r = 1.00$).

CONCLUSIONS

In answer to Research Question 1, the importance of addressing certifications in a four-year institution, this research study indicates that, in general, it is not important for universities to design curricula or address the core competencies of the ICCP certification or certifications, in general. Interestingly, the statement responses were well grouped regardless of the *length of time certified* category. See Appendix C. In answer to Research Question 2, how professionals receive the knowledge to obtain the certification, this research indicated, for the most part, the respondents would much prefer to study on their own (87%) and/or take a one-time preparatory course taught to the examination (47%). The correlation analysis indicated that the responses on related statements were predictable. The high degree of significance indicates a very small possibility that these correlations occurred by chance.

The implications of this research indicate that universities should not develop curricula to address certifications. However, it might be beneficial if universities developed a short course to teach a specific certification as part of a lifelong learning non-degree program (a one-time preparatory course) or as part of an existing IT curriculum. It was noted that this research surveyed individuals with certifications in hand; the outcome might be different if the survey were to include non-certified individuals attempting to pass initial certification examinations. It was also noted that there were a small number of newly-minted certification holders. Further research is needed to look at the needs of these non-certified individuals as relating to university curricula and to determine if results would change if the population consisted of certification holders less than 10 years.

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Appendix A. Survey

1. Do you work in the IT field?

Yes No

2. What type of certification do you hold?

ACP CCP

3. This (these) certification(s) helped me obtain, or advance in, my job.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

4. How many years have you held the certification(s)?

0-3 4-8 9-15 16-20 Over 20

5. It is important to have curriculum designed to address ICCP professional certification core competencies in a four-year institution.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

6. It is important for four-year institutions to address professional certifications in general.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

7. It is important for four-year institutions to address ICCP professional certifications in particular.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

8. I would prefer to study for the ICCP professional certification exam on my own.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

9. I would prefer to study for the ICCP professional certification in a one-time exam preparatory course.

Strongly Agree Agree Partially Disagree Disagree Strongly Disagree

Appendix B. Correlation

		CURRICUL	ADDCERT	ADDICCP	STUDYOWN	PREPCRSE
CURRICUL	Pearson Correlation	1	.924**	.689**	.026	.026
	Sig. (2-tailed)	.	.000	.000	.816	.816
	N	86	86	86	86	86
ADDCERT	Pearson Correlation	.924**	1	.780**	.096	.096
	Sig. (2-tailed)	.000	.	.000	.381	.381
	N	86	86	86	86	86
ADDICCP	Pearson Correlation	.689**	.780**	1	.205	.205
	Sig. (2-tailed)	.000	.000	.	.058	.058
	N	86	86	86	86	86
STUDYOWN	Pearson Correlation	.026	.096	.205	1	1.000**
	Sig. (2-tailed)	.816	.381	.058	.	.
	N	86	86	86	86	86
PREPCRSE	Pearson Correlation	.026	.096	.205	1.000**	1
	Sig. (2-tailed)	.816	.381	.058	.	.
	N	86	86	86	86	86

** Correlation is significant at the 0.01 level (2-tailed)

Appendix C. Analysis of Responses by Age

Length of time held		CURRICUL	ADDCERT	ADDICCP	STUDYOWN	PREPCRSE
0-3	Mean	2.6667	2.6667	2.3333	3.6667	3.6667
	N	3	3	3	3	3
	Std. Deviation	.57735	.57735	.57735	.57735	.57735
4-8	Mean	2.8750	2.8750	2.8750	3.6250	3.6250
	N	8	8	8	8	8
	Std. Deviation	.83452	.83452	.83452	.91613	.91613
9-15	Mean	2.5652	2.4783	2.3913	3.5217	3.5217
	N	23	23	23	23	23
	Std. Deviation	.99206	.89796	.72232	.73048	.73048
16-20	Mean	2.5200	2.4000	2.2800	3.5600	3.5600
	N	25	25	25	25	25
	Std. Deviation	.82260	.81650	.79162	.65064	.65064
Over 20	Mean	2.8519	2.7778	2.4444	3.2963	3.2963
	N	27	27	27	27	27
	Std. Deviation	.98854	.84732	.69798	.60858	.60858
Total	Mean	2.6744	2.5930	2.4186	3.4767	3.4767
	N	86	86	86	86	86
	Std. Deviation	.91320	.84544	.74305	.68129	.68129

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