Information Technology Certification Value: An Initial Response from Employers

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ABSTRACT

This article looks at the value of certification from the employer's perspective. It is perhaps the first study in this area that gathers data directly from employers. A survey of directors of university information technology departments is analyzed, and the results indicate limited support for certifications being valued assets of their employees. While not sufficiently strong enough to warrant generalization of the results to business in general, with this information, students and professionals should be able to better prepare themselves for finding employment and academic programs can better evaluate the appropriateness of the inclusion of certification training in their curricula.

INTRODUCTION

The necessity for certifications has become a fact of life for information Technology (IT) professionals. Almost any position posting encountered will list some certification requested or required. However, the extent and nature of certification valuation by employers remains unclear. Past research is limited and has examined the relationships between certifications and job skills and education. While important, the existing research provides mostly anecdotal support for the value of and acquisition of certifications. The research focus of this article is to analyze data gathered directly from employers on their views and practices with respect to IT certifications. As such, the article provides significant new insights into this important topic. Specifically it provides direction for the various stakeholder groups. For academics it provides justification for the inclusion of certifications in their programs. For managers it provides validation for their investment in certification training and employee retention. For students and technology professionals it provides motivation for the acquisition of certifications.

One of the earliest certifications programs was that of the Institute for Certification of Computing Professionals (ICCP) in 1973. This organization continues to provide centralized exam development and testing for the Information and Communications Technology industry. Unlike product specific certifications, ICCP certificate holders have to exhibit comprehension and knowledge of stringent industry fundamentals, not single product specifics. However, as the industry matured and technology products became more sophisticated a need arose for more targeted certifications.

It is generally accepted that the first technology specific certifications were offered by Novel in 1989 (Benham, 2006; Randall & Zirkle, 2005; Hitchcock, 2005; Adelman, 2000). Certification

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programs were initially developed to provide product specific technical expertise. In addition to Novel, Microsoft, Cisco, Oracle and others have also developed certification programs to support their products. In many cases the certification training is an expected and anticipated part of a company's technology product offerings.

Based on the success of the product specific certifications, targeted non-product specific certification offerings were further developed by independent certification and training organizations. Examples of these include the A+, Network+, and Security + certifications by Comptia, SSCP and CISSP by $(ISC)^2$, and others. These organizations try to fill in for those companies and products that can't afford to support their own certification programs, or to provide more general non-product specific training.

Today, certifications play a significant role in the technology workplace. Todd, McKeen and Gallupe wrote a baseline article in 1995 that used an analysis of newspaper job postings from 1970 to 1990 to analyze the evolution of job skills. Their analysis covered a period where the industry saw continuous growth from 1970 to 1985 followed by a downturn. They interpreted their results as indicating that organizations were looking for a diverse set of technical skills.

More recently, Benham performed a complimentary study using content analysis of job ads in 2006. Results from his study indicated that educational requirements are also increasing. It identified that for the period 2001 – 2006, while requirements for certifications by employers decreased significantly, for those jobs that did require certifications, educational requirements also existed.

This article builds on these efforts to identify the employers' perceptions of the value of IT certifications. It establishes the value that employers place on certifications, in a more direct way than has been done previously, by determining direct company financial support of certification. The next section provides a review of the literature that focuses on certifications. This is followed by a discussion of the types of value that certifications provide. Next, the research methodology is presented with an analysis of survey results from directors of university IT departments. Finally, conclusions and suggestions for further research are presented.

LITERATURE REVIEW

The nature of the certification industry and its success has resulted in targeted research in three focused areas. These include: the relationship between certifications and college educational programs, the use of certifications in hiring practices, and the use of certifications for employment preparation. This being said, Hitchcock (2005) found no major research into industry certification and few scholarly articles in the certification area.

The lack of research combined with the growing presence of certification bodies and the increased technical complexity of today's businesses requires that a deeper understanding of the value of and need for certifications take place. Presented here is a discussion of the research in each of the identified focus areas.

Relationship between certifications and college educational programs

One of the more explored areas of certification literature is the integration of certifications into educational programs. Most of this research is written from an assumption that there is value, to both the student and the employer, by being certified. Adelman (2000), as part of his U.S. Department of Education report on the IT certification system, identifies the differences between

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the providers of certifications and traditional academic programs, along with justification for the development and direction of the differences.

Schlichting and Mason (2004) studied the relationship between academia and their use of certifications. They compared the demand for IT certification to that required in the fields of accounting, nursing, and teacher education. In a survey of accredited technology programs they found that less than 8% offer certification as part of their programs. This indicates a reluctance to move in the direction of required certifications. White (2006) proposed a four-year curriculum in Network Infrastructure based on vendor/industry certifications. Hitchcock (2007) evaluates the role of certifications in traditional academic education. He classifies certification training as a more functional curriculum development paradigm; that it is a complement to academic qualification and therefore can be successfully integrated into academic curricula.

While much has been written about the integration of certifications into college curricula, justification for such integration has yet to be evaluated. In fact, no definitive conclusions as to whether or not such integration has been effective or is desirable have evolved. This calls into question the necessity for such curriculum programs and further value of, and need for, certifications.

Use of certifications in hiring practices

Another major focus area of certification literature deals with the use of certifications as part of the hiring process. Gill and Pidduck (2001) provide an industry case study on recruitment and retention techniques. They investigated causes for employees leaving, IT employment trends, and career needs of IT professionals. Based on their results they presented a balanced program of focusing on interesting and challenging work, an enjoyable work environment, and competitive compensation.

Bartlett (2002) found that the perception of the value of IT certifications differed between senior human resource managers and their IT employees. HR executives ranked traditional 4-year college degrees higher than IT industry sponsored certifications and used certifications as a means to simplify the identification of applicants' skills. Their IT employees viewed their certifications as reducing the cost of training and increasing their chances for success as a new hire. Bartlett (2002) also performed a two-group quasi-experimental design to evaluate employer's preference for certifications or 2-year academic degrees. He concluded that employers preferred a 2-year degree over certifications but they identified previous work experience that aligns with the needs of their firm as more important than either the academic degree or certifications.

Al-Rawi, Lansari, and Bouslama in Randal and Zirkle (2005) concluded that companies seek out professionals with certifications because they represent a standard measure for specific IT skills. Nierderman, Sumner, and Maertz (2006), in their article on IT personnel turnover, found positive associations between job performance and job discretion, career support, and participation in training activities; including certification. Enns, Ferratt, and Prasad (2006), classify several stereotypes of IT professionals and suggest targeted training actions, including certifications, to best meet the retention objectives for the organization. Karlin (2007) quoted Joel Burchett, an IT systems specialist with ChaCha Search, a search engine start-up, as saying, "Most hiring managers are not technical and rarely ask IT personnel to be a part of the interview process, so as not to risk the liability of an untrained person asking an improper or illegal question in an

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interview. So they require a person to have 'industry' certifications, hoping this proves technical competence."

The need for proven technical competence is growing in some particular areas. One of those is IT security. Even during the recent recessionary period, security certifications consistently grew in demand due to drivers such as new regulation and increasing threat levels. The technical nature of IT security and its importance to companies demands that attention be given to those responsible for it (Nurik, 2010). Another area of high sensitivity to many organizations is the necessity to store huge amounts of data. Roughly one-third of organizations feel that their data storage requirements will be twice as great by 2012. This is helping to fuel greater numbers of network storage certifications (Talbot, 2011).

Employment preparation and satisfaction

The final focus area examines certification not from the employer's perspective but from the employee's. This perspective looks at how certifications assist in finding and retaining employment. Benamati and Lederer (2001) surveyed IT professionals to determine how they coped with the rapid change associated with their industry. Their results indicated that customized education on new IT was one of the strongest predictors of success, but general or informal education was not. In a study by Schambach and Blanton (2002), IT professionals stated they believed that professional development improved professional competence and performance. However, they also found that professional competence is not as correlated to job security and decision authority. They also determined that formal development activity participation might be a better indicator of overall organizationally inspired motivation for maintaining professional competency.

Tsai, Compeau, and Haggerty (2004), discussed how IT professionals cope with the necessity of maintaining their technical competence. They found that the coping strategies used were dependent upon the organization structure and employment level. Sumner, Yager and Franke (2005) evaluated an employee's commitment based on four career anchors: creativity, autonomy, identity, and variety. In their study other anchors such as technical competence, including certification training, were not found to be statistically identified as contributing to organizational commitment. Nierderman, Sumner, and Maertz (2006), in their article on IT personnel turnover, found positive associations between job performance and job discretion, career support, and participation in training activities; including certification. Mahatanankoon (2007) used a survey of IT professionals to determine that formal professional development activities contributed most to the progress of an IT career, but not to career satisfaction. Additionally, Woratschek and Lenox (2002), in a survey of employers entry-level job skill expectations found certifications were not necessary and that non-technical skills were as important as if not more important than technical skills.

The above research portrays a somewhat confusing situation with respect to how certifications are viewed by IT professionals and the organizations for which they work. What seems to emerge is a picture of IT certifications viewed by organizations as representative of specific skills. These certified skills play a role in hiring decisions by demonstrating technical competence where appropriate, but general education and work experience are more highly valued.

On the other hand, the training associated with certifications, if supported by organizations, is highly valued by IT professionals as a major component of career development and job competency. The requirements for certifications are closing the gap between the perceptions of

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their value by these two groups. Employers, as well as IT professionals, are increasingly turning to specific certifications as job necessary to demonstrate being current with technology. Most certifications require continuing education to be maintained. This trend is expected to continue as younger, certified IT professionals move into the management positions of older professionals. "The time is coming when the word *certified* will be a synonym for *employable*" (Perkins, 2010).

Certification value

The "business" of certifying IT professionals continues to thrive. Why this is so is the question underlying the discussion of certification's value which follows in the remainder of this article. That there is value associated with certifications is evident by the successful introduction and growth of the certification industry. There are currently in excess of 300 different certifications available for IT professionals. The benefits of certifications are extolled far and wide by both industry participants and academics alike. Mason (2003) identifies several benefits for students: holding a certification increases one's salary by 10 - 20 %, improves the prospect of employment, improves self confidence, and provides objective documentation of one's technical competence.

For industry, certification provides a base level of known and desired technical skills, reducing training costs and time. Mahaney and Greer (2004) conducted an investigation into the business value of Project Management Professional (PMP) certifications and identified several reasons that businesses should encourage project managers to pursue PMP certifications, although the benefits are not easy to quantify. White and Cook (2003) compared IS professionals' valuation of professional and vendor certification types. They suggested that technical and managerial IS professionals value the two types of certifications differently when job position is considered. Johnston and Wierschem (2007) also mentioned that PMP certification is a necessity to work in IT project management and a critical factor in hiring decisions. However, Cegielski, Rebman, and Reithel (2003) studied the value of certifications based on the perceptions of end users of local area networks. In their study they found that the perception of the end users was no different whether the LAN administrator was certified or not.

While the specific valuation of certification is difficult at best to achieve, there are several major contributors to its valuation and thus to the determination of its use by both employers and job seekers. The following discussion concentrates on the possible influences of higher education and employment recruitment on certification valuation.

Factors impacting certification value

Education – number of IT degrees awarded

As shown in Figure 1, since 1970 the number of computer and information science degrees awarded has grown from 2,388 to a high of 59,488 in 2003-2004. Since then however, the number of degrees awarded has consistently declined from its high in 2003-2004 to 42,170 in 2006-2007 (a decline of 29%), the latest dates for which data is published (Table 302 US Department of Education). This dramatic change in the number of degrees awarded does not mirror the general employment trends of the industry. From 1999 to 2008, employment in the IT industry, categorized as the Computer and mathematical science occupations, has shown a relatively consistent rate of growth averaging approximately 3% a year.

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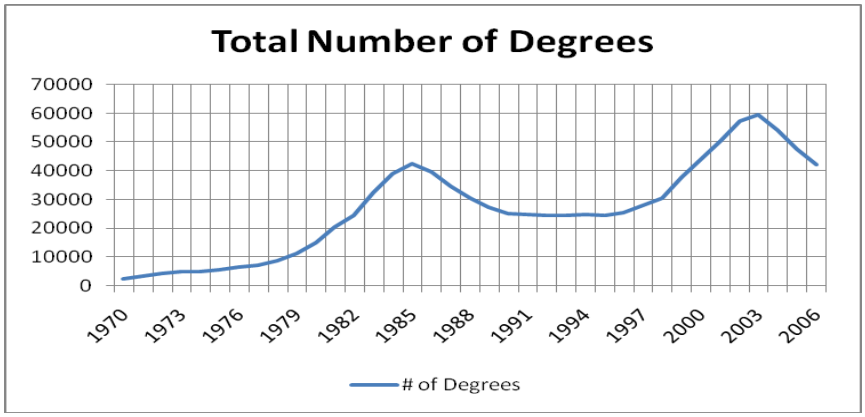
Figure 1: Total number of degrees by year.



It is interesting to note that the development of certification programs occurred during a time when the number of degrees awarded was in fact decreasing. From 1985 to 1992 the industry saw a decrease from 42, 337 degrees awarded to 24, 519, a decrease of 42%. They did not begin to increase again until 1996. This supports the argument, as identified by Karlin(2007), that product vendors use certification as a means to influence the marketplace through familiarization and that certification programs were primarily developed to meet the specific needs of technical support for major product vendors. If there were not enough college graduates entering the marketplace, then vendors needed to be able to identify technically qualified people to support their product lines. In the current period of a declining number of degrees being awarded, the same increase in the valuation of certifications as a means to address the shortage of available product specialists may be reoccurring.

Employment - recruitment

Cappel (2002), in a survey of employers on entry-level job skills, identified the key skills as programming, non-technical soft skills, and the ability to learn. He also found that experience was the most sought after form of knowledge acquisition. Woratschek and Lenox (2002) looked at the entry level job skills required by employers. They replicated Cappel's study with a few minor modifications and found that while specific skill sets, such as programming and the systems development life cycle (SDLC), are required, specific certifications were not. Garrison and Posey (2006) provided guidelines for companies that are unable or unwilling to hire certified security professionals to conduct risk analysis, perform vulnerability assessments, educate employees and develop computer security policies and procedures.

In his opinion, Casey Cegielski (2004) identified that HR professionals placed a significant amount of value on certifications in candidate selection, more than the IT professionals did. Agarwal and Ferratt (1998) in their paper discussing recruiting, retaining and developing IT professionals, identified that systems for identifying training and development needs were crucial factors for retention by organizations. Agarwal and Ferratt (2001) proposed a variety of HR strategies based on the anticipated length of the employment relationship and the concern for the individual's productivity contribution to the firm. Certifications and training were identified as more likely to be encouraged for longer term employees with higher productivity expectations. Clearly the use of certifications for employment purposes is complex and fluid. HR professionals view them differently than hiring managers. According to the above two articles, specific demand for certifications was not compelling, reflecting a less than expected valuation when recruiting employees.

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This article looks at the valuation of certification from the employer's perspective based on their actual employment reward systems. The value that an organization places on certifications can be determined based on many factors, including their investment in required and supported certification training expenditures. The method for gathering data to more fully explore how employers feel about certifications is discussed next.

METHODOLOGY

To gain the employer's perspective on IT certifications, an anonymous survey was distributed to the IT directors of 500 randomly selected U.S. university information technology departments. The sample was obtained from the university population of 4282 as defined by the Higher Education Directory and consisted of the following Carnegie classifications: Doctoral/Research Universities-Extensive and Intensive; Master's Colleges and Universities I and II; Baccalaureate Colleges-Liberal Arts and General, and Baccalaureate/Associate's Colleges. These classifications represent the total identified population set of 1469 universities. The selection criteria for classifications used to define the population of interest consisted primarily of them representing typical four year academic institutions of higher education with common operational characteristics. Including two year community colleges, for example, which often have a separate taxing authority, would require the necessity of isolating the different funding impacts on the decision making processes of the IT directors.

A sample size of 500 was selected (assuming a reasonable response of 12%) because it would result in the needed 62 observations necessary to achieve a margin of error of 1 with a 95% confidence level for the worst case scenario in the survey instrument and also fit available funding for multiple mailings. In actuality, the survey achieved a response rate of 29% with 144 responses.

The survey instrument contained 17 questions printed on the front and back of a single sheet of paper. As discussed previously, research in this area is minimal and mostly anecdotal. However, existing and related research surveys were reviewed for insight into the development of the survey instrument. No direct questions existed for inclusion into the survey instrument. Instead research concepts from previous articles, such as that of Todd, McKeen, and Gallupe, R. B. (1995) and Al-Rawi, Lansari, & Bouslama in Randal and Zirkle (2005), were used to develop a master list of questions.

The final list of questions was selected based on a focus on the valuation of certifications (See the Appendix for the questionnaire). Demographic information collected consisted of the number of employees in the IT department, number of students enrolled at the university, and whether the institution was public or private (Questions 1 through 3). Question 4 was used to establish a minimal degree of valuation of certifications. If answered "No," respondents were directed to return the survey without answering further questions. The remainder of the survey focused on the university IT departments' perceptions of the value of certification. Do they require or recommend certification? If so, which ones (Questions 4 through 10)? How do certifications stack up against experience (Questions 11 and 12)? Do they reward for certifications? Do they financially support certifications (Questions 13 through 15)? What percentages of employees have certifications and what certifications are most valued (Questions 16 and 17)? All questions are explained in more detail when presented with the survey results.

A pilot test of the survey instrument was conducted in the Spring of 2008 to evaluate the usability of the survey instrument. Based on feedback from the pilot test, modifications to the

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instrument were made. The updated survey was then distributed in the Fall of 2008 to the sample set of 500 universities. The surveys were addressed to the Director of IT services at each university. Four weeks later a second mailing of the survey was made. Because the survey was anonymous, a second complete mailing of the sample set was delivered. It was requested in the second mailing that if the recipient had already completed the survey previously, they were not to respond to the second mailing.

A total of 144 usable surveys were returned for a response rate of 29%. Table 1 describes the overall demographics of the sample respondents' universities. Table 2 describes the individual descriptive statistics for the sub-categories of Public and Private Universities.

Table 1: Number of students enrolled and number of IT department employees.

	Number of Students Enrolled	Number of IT Department Employees
Max	36,000	450
Min	350	2
Average	6,566	37
Std. Dev.	8,005	59

Table 2: Number of students enrolled and number of IT department employees in public and private universities.

	Number of Students Enrolled		Number of IT Department Employees	
	Public	Private	Public	Private
Max	36,000	15,500	240	450
Min	1,400	349	4	2
Average	11,884	3,182	56	26
Std. Dev.	9,920	3,646	57.8	57.2

As previously noted, the study population consisted of the 1469 institutions listed in the Higher Education Directory. Of those universities listed, 36% (530) were public and 64% (939) private. The sample set consisted of 500 randomly selected institutions from the population set. Of the sample universities, 28.2% were public and 71.8% private. The respondent set of institutions consisted of 38% public and 62% private.

The validity of the sampling was tested using standard confidence interval analysis. The proportion of Public vs. Private university participation in the survey for the representative sample was not within the 95% confidence interval relative to the population set. The proportion of Public vs. Private university responses to the survey was within the 95% confidence interval relative to the population, but not to the sample set. See Table 3 for the Confidence Intervals. While the sample set did not fall within the 95% confidence interval of the population, the fact that the resulting respondent set did validates the acceptability of the randomly selected sample set and its use.

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Table 3: Sampling analysis.

	Public Universities	Private Universities
Population, n = 1496	36% (530)	64% (939)
Sample Set, n = 500	28.2% (141)	71.8% (359)
Sample Set 95% C.I.	31.4% - 50.1%	48% - 68%
Respondent Set, n = 141	38% (56)	62% (85)
Respondent Set 95% C.I.	37.7% - 46.3%	49% - 69%

ANALYSIS

A series of questions was asked of university IT directors to determine how they value certification as defined by their willingness to require and invest in employee certification. Of the 141 respondents, 45% either required or desired their employees to have IT related certifications. Of those respondents that required or desired certifications, 14% required employees to have one or more certifications and an additional 12% expected their employees to actively pursue certifications. This is consistent with Benham's (2006) research of job postings which found that 14% of the job postings identified a requirement for specific certifications.

Employers that mandate certifications required multiple certifications depending upon the position held by their employees. The positions that were identified as requiring certification included: Assistant Director of Technical Services, Cable and wiring manager, Computer technician, Data network and Systems support team lead, Director of IT, Hardware support specialist, Help desk technicians, Information Security Officer, IT technician, LAN engineer and technician, Network engineer, Lead telecommunications engineer, Network Administrator, Network engineer, Network Manager, Network Operator, Network services, Operations and support leader, Server Administrator, Server engineer, Server Manager, Systems analyst, Systems administrator, Systems engineers, Voice and data installation.

As can be seen, the variety of positions that have required certifications covers the depth and breadth of technology positions. It is interesting to note that no respondent required certifications in all positions. This could indicate a specific valuation of certifications for certain positions and certifications that have been deemed to provide value to the organization. Of those positions identified, systems positions and networking positions are the most often cited as requiring certification, followed by technicians. The lack of database certifications, only one employer identified a need for Oracle certifications, perhaps indicates an associated lack of valuation for database certifications.

For those employers having at least one employee with a certification (40% of the respondents), the average percentage of employees holding at least one certification was 33.5% and ranged from 2% to over (there are 2 in the 91-100 range) 90%. Table 4 shows the number of employers having percentages of employees with at least one certification in the indicated ranges.

The respondents that required or desired their employees to have IT certifications were asked to identify the importance of an applicant for a full time position to have at least one certification on a scale of 1 to 5, with 1 being Not at all Important and 5 being Very Important. The respondent's average response was 3.08. This is surprisingly neutral since 32% of the respondents that required or desired their employees to have IT related certifications require at least one certification and 25% have certification expectations. One reason for this inconsistency

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may be that, of those employers that required certifications, they have required them for an average of only 4.7 years. The longest period was 15 years and 10 of the respondents had required certifications for five years or less, indicating that this is a relatively recent addition to their employment practices.

Table 4: Percentage of employees with certifications.

Percentage of employees with certifications	Number of employers
1-10%	10
11-20%	15
21-30%	10
31-40%	5
41-50%	7
51-60%	2
61-70%	3
71-80%	2
81-90%	1
91-100%	2

The certifications identified as being required, and the total number of times each was indicated, are shown in Table 5.

Table 5: Required certifications.

Certification	# OF TIMES IDENTIFIED
A+	7
CCNA (Cisco Certified Network Associate)	6
CCNE (Cisco Certified Network Expert)	3
CCNP (Cisco Certified Network Professional)	2
Help Desk	2
MCDBA (Microsoft Certified Database Administrator)	1
MCSE (Microsoft Certified Systems Engineer)	10
MSCP (Microsoft Certified Professional)	1
Networking	2
RCDD (Registered Communications Distribution Designer)	3
Security	3
System Software Specific	12

System software certifications included Apple, Dell, Cisco, etc. that were single identifications of individual specific vendors. Microsoft and Cisco based certifications topped the list. In fact, networking based certifications dominate the certification list. However, the small number of security certifications is surprising.

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The next question asked employers requiring certification was what the expected primary benefit of having the certification was. The answers were varied, but could be categorized into a few general expectations. The most often cited was that of providing a baseline for technological knowledge. Included with this were expectations for a reduction in ineffective and inefficient work assignments. Or as one respondent put it, "the expected benefit is that new employees will be more productive sooner." Another stated expectation was, "it provides a fundamental level of knowledge in a particular area. Can provide a way to weed out unqualified applicants." Several respondents also commented that it provided a way for employees to stay current with the technology, as well as a way for upper level managers to better implement training and retention strategies.

While Agarwal and Ferratt (2001) suggest that the role of certifications should be a part of a targeted employee retention HR strategy, from the responses to the survey this opinion was not specifically identified. However, the respondents were IT directors and for those employers that do require certifications, such a strategy may be in place.

When asked directly how accurate IT certifications are as an overall indicator of competence in the associated subject matter, the respondents averaged 2.94 on a five point scale with 1 being Not At All Accurate and 5 being Very Accurate. This supports Cegielski's (2004) work that found minimal beliefs that certification correlated to ability.

The respondents were then asked to indicate their weighted value of certification to experience on a seven point scale valuing certification from 100% and experience 0% (1) to certification 0% and experience 100% (7) and (4) being 50/50. The average weighting was 5.02 or approximately 40% certification and 60% experience. Raw figures indicate that experience is valued much more than certifications. Table 6 shows the number of respondents for each scale weighting. These results support the work of numerous researchers such as Bartlett (2002 and 2004), Benham (2006) and Cappel (2001) which all stated that experience had more weight than having certifications in the hiring process.

Table 6: Certification value vs. experience value.

Scale Value	Certification Value	Experience Value	# of Resp.
1	100%	0%	0
2	80%	20%	1
3	60%	40%	1
4	50%	50%	8
5	40%	60%	20
6	20%	80%	31
7	0%	100%	2

To this point the value of certifications has been indicated by their requirement and perceived value by the employers. However, the next series of questions asked respondents to what degree they financially invested in certifications. 69% of those that desire or require their employees to have certifications offer financial compensation for obtaining certifications. This includes such things as formal training, training materials, and the actual exam costs. Most financial support was payable upon successful completion of the certification exam. Only 6 employers (10% of

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those that desire or require their employees to have certifications), went so far as to provide salary adjustments for holding or acquiring certifications. Those that did ranged from 3% of base pay to a 10% increase, or a promotion in pay grade.

To explore further how employers that desire or require their employees to have certifications value those certifications, comparisons were made within this group between those providing some form of financial support and those not providing any financial support. Out of the 64 employers that require IT certifications, there are 44 providing financial support and 20 not providing support. Therefore, two groups were compared in terms of their perceptions of the importance of IT certifications (Question 5), the competency accuracy of IT certifications (Question 11), and the relative value of certification to experience (Question 12).

The results from one-way ANOVA tests are presented in Tables 7-9. It is found that with regard to the importance of IT certifications, the group providing financial support has a significantly higher mean value than that of the group not providing financial support (μ_f= 3.32, μ_n= 2.55, p=0.021). With regard to the competency accuracy of IT certifications, the group providing financial support again has a significantly higher mean value than that of the group not providing financial support (μ_f= 3.21, μ_n= 2.40, p=0.008). Finally, as per the relative value of certification to experience, the group providing financial support has a higher mean value than that of the group not providing financial support (μ_f= 5.23, μ_n=4.55, p=0.1), although the difference is not statistically significant.

Table 7: One-way ANOVA analysis of the importance of IT certification.

	Provide Financial Support	**No Financial Support Provided**
Population, n = 64	68.8%	31.3%
Mean value of importance of IT certification (Q5)	3.32	2.55
One-way ANOVA *p* value = 0.026		

Table 8: One-way ANOVA analysis of the competency accuracy of IT certification.

	Provide Financial Support	**No Financial Support Provided**
Population, n = 64	68.8%	31.3%
Mean value of competency accuracy (Q11)	3.18	2.4
One-way ANOVA *p* value = 0.013		

Table 9: One-way ANOVA analysis of the relative value of IT certification to experience.

	Provide Financial Support	**No Financial Support Provided**
Population, n = 64	68.8%	31.3%
Mean value of relative value of IT certification vs. experience (Q12)	5.23	4.55
One-way ANOVA *p* value = 0.115		

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The final question asked respondents to list the top five certifications of value to their departments. A total of 51 different certifications were identified, about 1/6 of the 300 available in the marketplace. Consistent with the required certifications, networking topped the list. Additionally though, making a strong showing were A+ and Oracle certifications. Microsoft and CISSP security certification also made the top 10. Table 10 shows the total counts of the most valued certifications listed by the respondents.

The list of desired certifications is significantly larger than that of the required listing. The difference may be attributable to the costs involved in obtaining certifications or the technical priorities of the employer. One thing identified is that there is a much broader interest in certifications for specific vendor software. Woratschek and Lenox's (2002) research asked if there was interest specifically in MOUS, A+, N+, or MSCE certifications. Their results identified that 40% of their respondents were interested in A+ and MCSE, 15% in MOUS and 5% in N+. This is similar to the results of this research as there was a high degree of interest in MCSE and A+. N+ was less desired and MOUS and was not even listed.

Table 10: Desired certifications.

Certification	Number	Certification	Number	Certification	Number
MCSE (Microsoft Certified Systems Engineer)	30	NOVELL	3	RHCE (Red Hat Certified Engineer)	1
CISCO	21	NETWORKING	3	RH LINUX	1
CCNA (Cisco Certified Network Associate)	17	MCP (Microsoft Certified Professional)	3	RCDD (Registered Communications Distribution Designer)	1
A+	17	HELP DESK	3	PROJECT +	1
ORACLE	12	WINDOWS SERVER	2	MSCP (Managed Services Channel Program)	1
MICROSOFT	8	WINDOWS	2	MS SECURITY	1
CISSP (Certified Information Systems Security Professional)	7	PMP (Project Management Professional)	2	MCNE (Master Certified Novell Engineer)	1
CCIE (Cisco Certified Internetwork Expert)	7	NORTEL	2	MCCP	1
MCSA (Microsoft Certified Systems Administrator)	6	MS NETWORK	2	ITIL (Information Technology Infrastructure Library)	1
CCNP (Cisco Certified Network Professional)	6	MCDBA (Microsoft Certified Database Administrator)	2	I-NET + (CompTIA i-Net+ Certification)	1
SECURITY	5	APPLE	2	IBM ISERIES	1
CCNE (Cisco Certified Network Expert)	5	WEBMASTER	1	HP	1

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PROJECT MGMT.	4	UNIX SERVER	1	DATABASE	1
NETWORK +	4	SUN	1	CWNA (Certified Wireless Network Administrator)	1
DELLHARDWARE	4	SSCP (Systems Security Certified Practitioner)	1	CNE/A	1
CNE (Certified Novell Engineer)	4	SOLARIS	1	BICSI (Building Industry Consulting Service International)	1
SECURITY +	3	SANS SECURITY	1	BACHELORS	1

CONCLUSIONS

This paper presented a summary of the literature associated with certifications in the IT industry. It then presented the results of a survey designed to identify the value that employers place on certifications. This work complemented that of others. Cegielski's (2004) results indicate value to HR personnel for different reasons than IT managers. It found that IT certifications were not viewed as a suitable measure to justify a new hire. Cegielski, Rebman, and Reithel's (2003) work identified that end-users did not perceive a higher value of local area network usefulness due to operation by certified administrators. This would imply that from the end users' perspectives at least, there is no value in having a certification. More closely related to this work, Benham (2006) did a review of IT job ads and found that IT certification is not essential to the IT profession.

The results from this work show that while IT employers in the academic community do value IT certifications, as exemplified by the 45% of the respondents that either required certifications or expected employees to be working toward certification, an overwhelming endorsement is not evident. While their motivations may vary, based on survey results some definitely will directly invest in the requirement and acquisition of certifications. As previously reported, the vast majority (69%) of those requiring or desiring employee certifications are willing to pay some, or all, of the associated costs. For them, the significance of their greater valuation of certifications is substantiated by the finding of the importance of certifications to them being statistically higher than those not offering any financial support for certifications.

Of the academic employers responding to the survey, 45% either required or desired their IT employees to have certifications. Within that group, 14% required at least one certification and an additional 12% expect their employees to actively pursue certifications. The fact that 45% view certifications positively is, at the same time, tempered by the realization that only 14% of them require their employees to have at least one certification. Certifications have value, but to what extent they have value may be the more pertinent question.

Some insight into this question is provided by other survey results. For the 45% of employers requiring or desiring certifications, the importance of having at least one certification was a very neutral 3.08 on a five point scale from Not at all Important to Very Important. Likewise, the accuracy of certifications reflecting competency in the associated subject matter was pegged at a similarly neutral 2.94 on a five point scale from Not At All Accurate to Very Accurate. However, just as with the importance of certifications, for the group willing to financially support certifications, they feel that competency is accurately reflected by certifications to a statistically significant greater degree than those not offering financial support. Why the

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seeming inconsistency between certifications being required or desired and not being 'that' important and 'that' accurate indicators of competence? Perhaps it has something to do with how employers view certifications versus experience.

Survey results put the weighted value of experience to certifications at approximately 60% to 40%. Referring to Table 6, if you consider the middle ground between the ranges of the answers of roughly 80% of the respondents, the resulting weighting of 70% experience/30% certifications would indicate that employers value experience more than twice as much as they value certifications. This is intuitively reasonable. You would not expect any kind of certification to be more than supplementary to demonstrated experience and expertise in a work related field. This even holds true in the comparison of those providing financial support and those not providing financial support where there was no statistically significant difference in their weightings. It may be an unfair comparison leading to a biased negative conclusion regarding certifications, but it certainly doesn't indicate that certifications aren't highly valued by a significant number of employers.

The implications of this research are important for both management and academics. For IT managers, this research validates that for many employers there is in fact value in certifications. They provide a variety of benefits other than just additional hiring criteria. These benefits include providing a base level of technical knowledge that result in earlier productivity gains, heightened employee value that results in increased retention, and increased awareness for the maintenance of technology skills in an ever changing technology environment. Academic employers are willing to invest hard dollars in IT certifications.

For academics, this research may help to establish a justification for inclusion of certification training as part of IT academic curricula. By providing certification training, students would have credentials that employers have identified as important, which should result in increased hiring rates of students. Certifications could also provide base level training that corporate HR personnel have specifically identified as differentiating criteria for employee selection. It would also provide an avenue for academic program differentiation which could result in increased employer interest and hiring.

LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

This research was based on a survey of IT departments in universities. While these departments are subject to the same hiring, retention, skill requirements, and employment pressures as 'for profit' businesses, there may be influences that inhibit the ability of these results to be generalized to a more expansive population. Therefore, an expanded study of 'for profit' businesses would serve to help validate the generalization of these results.

In an expanded study, there is perhaps a need to further explore the relationship, if any, between experience on the one hand and certification on the other. What are the circumstances surrounding when one is more important than another? Are these circumstances job related, organizational structure or size related, business environment related, or business technology infrastructure related? These circumstances may be the key to truly understanding the value of IT certifications. Additionally, more work should be done to examine the indications that certifications are at best an average indicator of competency and while desirable, or even required, possess only average importance as an employee asset.

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As previously pointed out, the business of IT certifications is huge. With the amount of resources being expended on them, it behooves us all to understand what kind of a return we are receiving on our investment. The question of the value of IT certifications deserves to be more completely answered.

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APPENDIX

Survey of Information Technology Certifications in University IT Departments

1. How many full time employees are there in your information technology department?

2. How many students are enrolled at your institution? _____

3. Are you a public or private institution? (Circle one) Public Private

4. Do you require, posses or desire your departmental personnel to have or obtain IT related certifications?

Yes No

If you answered No to question 4 you are finished with the survey.

Please return it in then envelope provided.

4. Using the scale below, circle how important it is that an applicant for a full time position in your department have a least one certification. (Circle one)

Not at all Important				Very Important
1	2	3	4	5

5. Do you have any positions that **require** employee certification? (Circle one)
(If you answer No skip to question number 9.)

Yes No

7. If you require certification to hold a position, approximately how many years has this policy been in place?

6. If you require certification for some positions, please list the certifications and their associated positions below.

Certification	Position
_____	_____
_____	_____
_____	_____

7. If you require certification, please explain the primary benefit expected:

_____

_____

8. Are full time employees in your department expected to pursue certifications? (Circle one)

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Yes No

11. Using the scale below, circle how accurate you feel IT certifications are overall as an indicator of competence in the associated subject matter.

Not At All Accurate				Very Accurate
1	2	3	4	5

12. Using the scale below, circle how you weight the relative value of certification to experience.

100% Cert.	80% Cert. 20% Exp.	60% Cert. 40% Exp.	50% Cert. 50% Exp.	40% Cert. 60% Exp.	20% Cert. 80% Exp.	100% Exp.
1	2	3	4	5	6	7

13. Does your department offer financial support for employees to obtain certifications? (Circle one)

Yes No

If you answered "Yes," a brief explanation of the form of financial support provided would be helpful and appreciated.

_____

_____

14. In your department, are any salary adjustments formally established for holding or acquiring certifications? (Circle one)

Yes No

15. If you answered "Yes," a brief explanation of the form of adjustment provided would be helpful and appreciated

_____

_____

16. What percentage of your employees hold at least one certification? _____

17. Please list the top five certifications that would be of value to your department.

1. _____ 4. _____

2. _____ 5. _____

3. _____

THANK YOU FOR YOUR TIME! IT IS GREATLY APPRECIATED.

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Information Technology Certification Value: An Initial Response from Employers

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Key Success Factors in Knowledge Transfer during M&A in Traditional Industries: An Empirical Study

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