2010 Higher Education Technology Leadership Study:
The Chief Information Officers of the Future

By Dr. Wayne A. Brown
Center for Higher Education Chief Information Officer Studies, Inc. (CHECS)
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I would like to thank the 243 people who responded to the 2010 Higher Education Technology Leadership Study survey and the more than 620 people who responded to the 2010 Higher Education Chief Information Officer Roles and Effectiveness Study survey. I could not complete this research without each of you. Your willingness to participate gives us all more information about the higher-education technology leadership profession. I also want to thank and recognize our sponsors. The study would be much more difficult to accomplish without their generous support.

**Charter Sponsors:**
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This is the second year I have conducted the technology leader (TL) survey. The results from the first year provided a number of insights and prompted additions to my longitudinal chief information officer (CIO) research in an attempt to gather additional information and to compare the CIO and institution management team (IMT) responses with the TL responses. The TL responses will provide yet another view of the CIO role—that of prospective candidates. The result is a unique compilation from the three different groups: CIOs, the management teams and the secondary technology leaders.

The inspiration for this survey came from information gleaned from the Higher Education Chief Information Officer Roles and Effectiveness Study, which has been conducted six times since 2003-2004 (Brown, 2006a, 2006b, 2008a, 2008b, 2009). During the past three versions of the CIO study, there has consistently been a large number of CIOs (more than 45 percent) who indicated they plan on retiring within the next decade. This retirement projection is cause for concern and it made me wonder about the next generation of CIOs, those individuals in the next organizational layer down from the current CIOs and who most likely aspire to attain the CIO role—the TL.

However, my personal experience and conversations with TLs led me to believe that not all of these secondary leaders were interested in assuming the executive technology role. These
upcoming leaders entered the profession because they enjoyed technology and some of them did not view the CIO position as a technology job. As a result, many of the TLs I have spoken with were not sure the CIO was a position they were interested in pursuing. Furthermore, I suspected the TL group might have a large percentage of people who were, like the CIOs, also planning on retirement within the next decade.

I also wondered about those TLs who were interested in the CIO position. What steps were those TLs taking to prepare themselves for the role? Did they have a higher-education degree and major that would make them competitive for the CIO role? Did they have mentors? Had they worked in positions that prepared them for a future CIO job? Were the TLs helping to create a career path that the next generation of TLs could follow if they wanted to become CIOs? The answers to these questions and others can provide important insight to the technology leadership profession and to the higher-education institutions we serve.

You may have noticed a new name is associated with my research: Center for Higher Education Chief Information Officers Studies, Inc. (CHECS). In the past, I have personally funded the surveys, publication and distribution of the study results. While I do love the subject, that financial burden combined with the enormous amount of work that goes into a national survey, as well as wanting to give the research a “home,” has motivated me to create a nonprofit organization for CIO studies. To this end, I established CHECS (www.checs.org) in 2009. The purpose of CHECS is to contribute to the education and professional development of the chief information officer in higher education. CHECS’ mission will be furthered through the continuation of research on higher-education CIOs as well as other higher-education technology leaders. In 2010, the CIO research will also include international higher-education institution CIOs.

The CIO research through CHECS is funded in two ways. It’s funded through the nominal charge for a PDF copy of the completed reports, funds raised through the CHECS’ resume review service and through the generous sponsorships from organizations such as our 2010 Charter, Platinum and Gold sponsors. In addition to supporting the research, funds raised are donated to higher-education scholarships that are focused on IT management. In 2010, CHECS began funding an endowed scholarship in the doctoral Computing Technology In Education program at Nova Southeastern University. CHECS is operated by an all-volunteer staff, including myself and the Survey Advisory Board.

I wish to thank the CHECS Survey Advisory Board, a board of respected and esteemed colleagues who draw on their vast CIO experience to provide insight and advice about survey content. Their input is invaluable.

The CHECS Survey Advisory Board is comprised of the following higher-education technology leaders:
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Theresa Rowe, Chief Information Officer, Oakland University;

Gordon D. Wishon, Higher education consultant

Thank you again for your continuing support. Please let me know if there are any questions or aspects of the higher-education technology leaders that are not covered here that you would like to see addressed in a future study.

Regards,

Wayne A. Brown, Ph.D.
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EXECUTIVE SUMMARY

This report will provide analysis and information on the higher education technology leader (TL), those in the next organizational layer down from the chief information officer (CIO), based on three different surveys that were conducted in the spring of 2010. More than 860 individuals participated in the surveys: 243 TLs, 440 CIOs, and 183 IMT (institution management team members). This report is the second of an annual survey focusing on the TLs. The CIO and IMT surveys have been conducted six times since 2003-2004. In addition to the surveys, the report incorporated candidate-requirement lists from 2009 and 2010 CIO job advertisements published in select reputable publications. This TL report will provide unique insight in current TLs’ outlook regarding the CIO role and it also examines how that viewpoint aligns with current CIOs’ and IMTs’ views on the role.

The findings from this compilation provided a great deal of new information about the higher-education TLs and the CIO career path. The new information includes the TLs’ perception of a CIO’s strategic responsibilities, education level and technology knowledge. While this new information is enlightening, there is much to learn about the CIO position and career path, as well as that group who might fill the position in the future; this research has provided a one of a kind examination of the two positions, the TL and the CIO.

In general, women have not comprised a large percentage within the technology profession and have not made up a majority of the higher-education CIOs or TLs. The 2010 survey revealed that the percentage of women TLs rose to 37 percent from 2009’s 33 percent. Moreover, women made up the majority in two age ranges: 46-50 and 61-65.

The 2010 TL and CIO surveys included their first question about race. The responses showed that 93 percent of TLs were White. The result was similar for the CIO responses (Brown, 2010).

The career path the TLs followed to their current position varied. Overall, the two prior positions for TLs were within the IT department, although the specific areas varied widely within the department. Also, faculty was named as one of the top job titles among the two positions held prior to the current position.

CIOs were asked about the titles they had held in their two previous positions. Almost 30 percent of the CIOs had been CIOs in their last position. The other titles that CIOs gave for their last position were from areas throughout the IT department.

The number one title CIOs gave for the position before their last position or two positions ago, 15 percent, was also CIO. The second most frequently listed CIO title for the position before last was faculty at 9.54 percent.

Sixty-four percent of TLs had an advanced degree and when examining only those TLs who aspire to the CIO role, the percentage rose to 69 percent. This finding is compared to the 2010 CIO finding where 79 percent of the CIOs had an advanced degree. Furthermore, when asked about the degree a CIO should have, more than 85 percent of the CIOs and IMTs believed a CIO...
should have an advanced degree. Given this information, it’s possible that an advanced degree has become a job prerequisite for the higher education CIO.

Regarding education field of study, the TLs who had either a technology, business, education or administration major accounted for 70 percent of the respondents. However, the surveys found that a significant percentage of CIOs and IMTs believed that "the major doesn't matter."

The TLs, for the second year, indicated technical knowledge was not one of the top five skills needed by the CIO. However, the CIOs and IMTs disagreed with the TLs. The CIOs and IMTs listed technical knowledge as one of the top five skills needed by a CIO.

The percentage of TLs who both wanted to be a CIO and who would be available in 10 years had declined by 7 percent from 2009 to 52 percent. In preparation for the CIO role, the number one response to who was helping an aspiring CIO prepare was “no one,” mirroring the 2009 response for this question. TLs and CIO responses disagreed on the best way to prepare for the position with CIOs favoring mentoring, while TLs believed on-the-job training was more fitting.

This second iteration of the TL survey combined with the sixth version of the CIO study uncovered new information. The two studies also validated previous findings and created new questions for the roles that make up the leadership of higher education technology departments.
INTRODUCTION

The 2010 Higher Education Technology Leadership Study was launched in February 2010; 2,126 individuals at 787 higher-education institutions in the United States were surveyed. The institutions were selected based on two criteria: the IT organization had a visible management level beneath the CIO and student population size.

The institutions surveyed had more than 3,000 students. The IT organizational structure of the 787 institutions was discerned from each institution’s Web site and it was clear from the structure there were managerial titles below the CIO. Of those surveyed, 243 individuals from 204 different institutions participated, giving the study a 11.42 percent return rate for the individuals and 25.92 percent institution return rate.

In addition to the information gleaned from the TL survey, this report also contains information gathered from the 2010 Higher Education Chief Information Officer Roles and Effectiveness Study CIO and IMT surveys. Four hundred and forty CIOs and 183 institution management team members responded to those surveys. The surveys were concluded in May 2010. Lastly, this report also contains information from an informal review of CIO job advertisements collected from EDUCAUSE, the Chronicle for Higher Education and HigherEdJobs.Com (www.higheredjobs.com) from April 2009 through May 2010.

This report is divided into two general sections. The first section, Characteristics of the Entire Group, examines all of the TLs who responded to the survey, both those who indicated they had an interest in becoming a CIO someday and those who indicated they did not have an interest. The second section, Leaders of Tomorrow, looks more closely at only the group who indicated they were interested in pursuing the CIO position.
**CHARACTERISTICS OF THE ENTIRE GROUP**

**Age**

The TLs were, as might be expected, overall younger in age than the CIOs. Only 33 percent of the TLs were older than 51 years old (Chart 1). This percentage remains consistent with the 32 percent of TLs who were older than 51 years old in 2009 while 59 percent of the 2010 CIO respondents were older than 51 years old.

**Chart 1. Age of Respondents**

**Gender**

Throughout the life of this research, the percentage of TLs and CIOs who were women has been low. In general, the percentage of women in technical jobs has historically been low. This lack of female representation is also present in the executive ranks across different types of industries where only 15 percent of the executives were women (Carter & Silva, 2010). In charitable organizations, the percentage of female executives was 18.8 percent (Joslyn, 2009). In 2006, 23 percent of college presidents were women (Jaschik, 2007).

In 2010, the percentage of female TLs was 37 percent (Chart 2). This percentage was an increase from 33 percent in 2009. Not only was it an increase from one year to the next, the 2010 female TL percentage was the highest female percentage across the TL and CIO surveys conducted by CHECS. While the percentage of female TLs rose, in the 2010 CIO survey, women accounted for only 23 percent of the respondents. This percentage is a decline from the 24 percent of female CIOs in the 2009.
There may be a number of reasons for the low percentage of women who are TLs and CIOs. In 2008, a survey of male and female students entering college found that only 9 percent of the females thought computer science was a good choice ("Career Watch," 2010). Also in 2008, "only 18 percent of computer and information science degrees" were earned by women (Collett, 2010). Second, a large percentage of women may choose to leave the technology workforce in their late 30s (Hewlett, Luce, & Servon, 2008). In fact, another study found that more than 50 percent of women in technology jobs left the workforce when they were middle managers (Collett, 2010).

**Chart 2. Gender**

![Pie chart showing gender distribution](chart)

When comparing gender across the different age range brackets in 2010 and 2009, there were interesting findings for the CIO and TLs. For instance, in the 2009 CIO research, the percentage of women by age range was fairly consistent (23 to 28 percent) across all ages except for the 36-40 age bracket where the percentage significantly dropped to 9 percent. By comparison, the 2009 TL survey revealed an overall percentage increase of women within the age range 41-45, reaching to 45 percent, but it never attained a majority percentage. In 2010, that changed.

The 2010 TL survey showed that women were in the majority for two separate age ranges: 46-50 and 61-65 (Chart 3). However, the percentage of women in the age ranges immediately preceding and following these majority bubbles dropped to less than 50 percent of the total. The decline could be indicative of a pipeline of female CIOs that may continue to shrink.
The 2010 CIO gender and age-range comparison is depicted in Chart 4. The female CIO percentage peaked at 31 percent in the 51-55 year old range.

**Chart 4. CIO Age and Gender**
Race

The 2010 CIO and TL surveys included for the first time a question about race. The options for the question are included in Chart 5. Both surveys (CIO and TL) revealed that 93 percent of the respondents were White. Among TLs, the second largest percentage group—5 percent—was Black or African-American. Among CIOs, Black or African-American and Asian each represented 3 percent of the respondents. The percentage of nonprofit organization chief executives who were not White was 6.3 percent (Joslyn, 2009). The percentage of college presidents who were Black or African-American in 2006 was 5.9 percent (Jaschik, 2007).

Chart 5. Race

The percentage of TL respondents who were Hispanic was 3 percent (Chart 6). In the 2010 CIO survey, 3 percent of the respondents were Hispanic. In 2006, 4.5 percent of college presidents were Hispanic (Jaschik, 2007).
Institution Types

The population for the TL survey was selected based on the institution student-population size numbering more than 3,000 and those institutions that had a visible IT management layer below the CIO. The institution types are those recognized as Carnegie types. Due to the institution-type selection criteria noted above, the institution types were more likely to be large institutions. As a result, more of the institutions were Doctorate and Master's types (Chart 7). The responding group did not represent the makeup of the institutions in the United States, according to the Chronicle of Higher Education (Almanac Issue, 2009).
Work Experience

One of the major challenges in determining the steps technology leaders should take in pursuit of the CIO position is developing an understanding of the steps current CIOs took in their career, including what position they’ve held in the past. The first generation of CIOs was the group that began leading the IT departments in the mid-1980s when the need for an IT executive first became apparent. Many of the first generation of CIOs did not work in the IT department when they started their careers. For example, some began their careers as faculty members before moving directly from non-IT department positions into the CIO role. However, replicating that first generation CIO-career path may not be possible in 2010. Currently, institutions searching for a CIO may require candidates to possess a significant amount of experience as an IT manager. As a result, aspiring CIOs are looking for definitive information about where CIOs have worked in the past. To provide a broad guide, 2010 TLs and CIOs respondents categorized their careers into four general working areas:

- Jobs held in higher-education IT;
- Jobs in IT, but outside of higher education;
- Jobs outside of both IT and higher education and;
- Jobs in higher education, but outside of IT.

Table 1 depicts a comparative average between TLs and CIOs in these four areas. Column 2 displays the average number of years the TL respondents had worked in four areas through the
course of their careers and column 3 displays the CIOs’ responses. In general, the two groups (TLs and CIOs) have worked in the same areas for a similar amount of time through the course of their careers. Overwhelmingly, the greatest number of years had been spent within the higher-education IT field and the least amount of time was outside IT and outside of both IT and higher education. This information may help the aspiring CIO make decisions about where they should work in order to become and remain competitive for a CIO position.

Table 1. Work Experience

<table>
<thead>
<tr>
<th>Area</th>
<th>2010 TL Years</th>
<th>2010 CIOs’ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Education IT</td>
<td>13.80</td>
<td>13.83</td>
</tr>
<tr>
<td>IT Outside of Higher Education</td>
<td>5.79</td>
<td>6.08</td>
</tr>
<tr>
<td>Outside Higher Education and IT</td>
<td>2.78</td>
<td>2.66</td>
</tr>
<tr>
<td>Higher Education Outside of IT</td>
<td>2.60</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Tenure

One of the anecdotal assumptions about higher-education IT executives has been that they change jobs frequently. The information gleaned from the CHECS CIO study has refuted this claim, and in fact has shown that the CIO, on average, has been in his or her position longer than the other members of the institution management team. The TLs continue this trend of remaining in their job for a significant period of time. In 2010, the TLs had been in their position for an average of five years and four months. This tenure is higher than 2009 when the TLs had been in their positions for an average of four years and nine months.

A review of 2009 to 2010 CIO job advertisements that stated the preferred years of experience showed the largest percentage of those employers (35.44 percent) wanted candidates with between six and 10 years of experience (Chart 8). The next closest experience requirement was five years or less at 32.91 percent. Based on the current average TL job tenure, the TLs would have had enough experience to at least be considered for some of the CIO jobs that were advertised between April 2009 and April 2010.
Retirement Plans

The impetus for the TL study was the past survey findings that a large percentage of higher-education CIOs (46.77 percent in 2010) predicted they would retire in the next 10 years (Chart 9). Fortunately, the TLs were not predicting retirement at the same rate as the CIOs.

Only 25.93 percent of the TLs were predicting they would retire in the next 10 years (Chart 10). The 2010 percentage is an increase from 2009 survey when 22 percent of the TL respondents predicted retirement in the next decade. Those 2010 respondents who answered “I don’t know” were not concentrated within any one age group. The retirement-projected group was spread across the different age brackets.
Previous Positions

One of the frequently asked questions about the CIO position by TLs and others is what is the career path? In other words, what are the jobs, experiences and education necessary to prepare one for and to become competitive in a CIO job search and also to succeed in the role after

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hired? One way to find a career path answer is to examine the jobs both the CIOs and TLs have held in the past.

The current TLs have held a wide variety of positions (Chart 11). In fact, no single job title accounted for more than 8 percent of the respondents. The job titles represented every major area within an IT department. In addition, CIO, chief technology officer (CTO), vice president, and faculty were represented in the responses.

**Chart 11. TL Previous Position Title**

<table>
<thead>
<tr>
<th>Position Title</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Director</td>
<td>8%</td>
</tr>
<tr>
<td>Application Development Director/Manager</td>
<td>7%</td>
</tr>
<tr>
<td>Network Director/Manager</td>
<td>7%</td>
</tr>
<tr>
<td>Executive Director</td>
<td>7%</td>
</tr>
<tr>
<td>Systems Director/Manager</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
</tr>
<tr>
<td>Desktop Support Director/Manager</td>
<td>5%</td>
</tr>
<tr>
<td>Engineer</td>
<td>4%</td>
</tr>
<tr>
<td>Assistant/Associate Director</td>
<td>4%</td>
</tr>
<tr>
<td>Academic Computing Director/Manager</td>
<td>4%</td>
</tr>
<tr>
<td>Help Desk Director/Manager</td>
<td>3%</td>
</tr>
<tr>
<td>Technician</td>
<td>3%</td>
</tr>
<tr>
<td>IT Manager</td>
<td>3%</td>
</tr>
<tr>
<td>Project Director/Manager</td>
<td>3%</td>
</tr>
<tr>
<td>Programmer/Analyst</td>
<td>3%</td>
</tr>
<tr>
<td>Network Admin</td>
<td>3%</td>
</tr>
<tr>
<td>Faculty</td>
<td>3%</td>
</tr>
<tr>
<td>Web Director/Manager</td>
<td>2%</td>
</tr>
<tr>
<td>Coordinator</td>
<td>2%</td>
</tr>
<tr>
<td>CIO</td>
<td>2%</td>
</tr>
<tr>
<td>Associate/Assistant VP</td>
<td>2%</td>
</tr>
<tr>
<td>Administrative Computing Director/Manager</td>
<td>2%</td>
</tr>
<tr>
<td>Security Director/Manager</td>
<td>2%</td>
</tr>
<tr>
<td>Vice President</td>
<td>1%</td>
</tr>
<tr>
<td>Telecommunications Director/Manager</td>
<td>1%</td>
</tr>
<tr>
<td>CTO</td>
<td>1%</td>
</tr>
<tr>
<td>Deputy CIO</td>
<td>1%</td>
</tr>
<tr>
<td>Database Administrator</td>
<td>1%</td>
</tr>
<tr>
<td>Consultant</td>
<td>1%</td>
</tr>
<tr>
<td>None</td>
<td>0%</td>
</tr>
<tr>
<td>Associate CIO</td>
<td>0%</td>
</tr>
</tbody>
</table>
The TL titles from two jobs prior to the current position were also diverse. There was no single job title that represented more than 7 percent of the respondents (Chart 12). Likewise, the job titles were spread across the IT department. Faculty, at 7 percent, was one of three titles tied for the most frequently listed. The other two titles with 7 percent of respondents were programmer/analyst and application development director/manager. Job titles in the “Other” category included accountant and mother.

While these results may not provide a conclusive career path for CIOs, one thing was clear, the future CIOs were being groomed in all areas of the IT department and many of them had worked in the faculty ranks.

Chart 12. TL Two Positions Prior Title

![Chart 12. TL Two Positions Prior Title]
In reviewing the last two job titles, 28.63 percent of the CIO respondents stated they were CIOs in their last job (Chart 13). Faculty was the fifth most frequent answer at 6.59 percent.

Chart 13. CIO Previous Position Title

When looking at the position title from two jobs ago, 15 percent of the CIO respondents had been CIOs (Chart 14). The second most frequent response was faculty at 9.54 percent. Of the responses about both the last job and the position held prior to it, the CIOs, like the TLs, listed titles which were from throughout the IT department. However the largest single percentage for both the CIOs last position and the one held prior to the last was CIO or senior IT leader.
Chart 14. CIO Two Positions Prior Title

Current Titles

The current TL titles were just as diverse as the previous titles. The leading title (13 percent) was associate or assistant vice president (Chart 15). All major areas of the IT department were again represented by the respondents.
Supervision

Supervision is a key component to becoming a CIO. The number of people supervised prepares the TLs for some of the challenges encountered by the CIO. On average, the TLs in 2010 supervised 32 people. This number declined from 2009 when the number of people supervised by the TL was 37.
Maintaining Knowledge

Constantly changing technology and the shifting landscape of technology leadership makes it critical for TLs to maintain their knowledge if they are going to be effective leaders. The top four activities the TLs used to maintain their technology knowledge in 2010 were reading, discussions with peers, conference attendance and working on projects (Chart 16); these activities were listed in the same order as the responses from 2009, although there were slight differences in the percentages from the 2009 TL survey to 2010.

Chart 16. Maintaining Knowledge

Closely related to maintaining knowledge is professional development. The 2010 TLs’ number one professional development method was higher education technology conference (Chart 17). This method mirrored the number one answer from the TLs in 2009. The higher education conference was the second most frequently given answer in 2010 versus leadership/management training in 2009. It is important for TLs to understand their industry, higher education. Attending higher education conferences may be one approach for TLs to develop a greater understanding of that industry.
The TL respondents were asked what certifications they possessed. The vast majority of the respondents, 72 percent, did not list any certifications (Chart 18). This lack of certifications may be appropriate considering the division of time a TL would spend in a technical role versus a leadership/management role. However, for those with a certification, the leading one was from the Project Management Institute (PMI).
Professional Affiliations

Professional affiliations can be important for any trained, specialized person. Additionally, affiliations can be invaluable for professional networking in one’s growth as he or she attempts to make his or her way to a senior functional area in an institution. The TLs were asked to identify their professional affiliations in 2010. Chart 19 depicts the top 14 affiliations as identified by the TLs. As in 2009, EDUCAUSE was the affiliation most frequently cited by the vast majority of the respondents.
**Degree Level**

The education degree held by a TL or CIO takes on a greater level of importance in higher education because providing education is core to higher education's mission. In 2010, 79 percent of the CIOs held an advanced degree. The mix of Master's and terminal degrees for the CIO in 2010 was 58 percent and 21 percent, respectively. In 2010, the percentage of TLs with an advanced degree rose to 66 percent from 61 percent in 2009 (Chart 20).
There were interesting differences in degree by institution type for the TLs. The charts below depict the TL degree level by institution type. There was a correlation between the level of the institution and those TLs who held an advanced degree. This correlation extended from the Associate's institution through the Master's institution, where the percentage of TLs with an advanced degree was 74.28 percent. However, for the doctoral institutions the percentage of TLs with an advanced degree declined to 64.14 percent (Chart 24). Chart 25 depicts the TL degree level and institution type.
Chart 22. Bachelor's Institutions

Chart 23. Master's Institutions

Chart 24. Doctoral Institutions
Women were 37 percent of the total TLs for 2010 and 23 percent of the total CIOs in 2010. There were differences when examining degree level by gender. The percentage of women was relatively stable for the Bachelor's and Master's degree holders. However, for the Associate's degree holders, women only made up 11 percent of the population and for the Doctorate-degree holders, women made up 50 percent of the respondents (Chart 26 and Chart 29).
Chart 26. Gender: Associate’s Degree Holders

- Male: 88.89%
- Female: 11.11%

Chart 27. Gender: Bachelor’s Degree Holders

- Male: 65.62%
- Female: 34.38%
In the 2010 surveys, the CIOs, IMTs, and TLs were asked what skills, education and degree major CIOs should possess. In addition, skills, education and degree major requirements were collected from the survey of CIO job advertisements.

The CIOs, in 86.36 percent of the responses, indicated the CIO should have an advanced degree, either a Master's or Doctorate (Chart 30). The IMT respondents gave similar responses, with
89.45 percent indicating that the CIO should have an advanced degree (Chart 31). If these responses are an indicator, the 34 percent of the TLs who did not have an advanced degree would have to earn one to become competitive for the higher-education CIO position.
Between April 2009 and May 2010, CIO vacancy advertisements and requirements were gathered from the Chronicle for Higher Education, EDUCAUSE, and HigherEdJobs.Com. The degree requirements for those 79 positions are depicted in Chart 32.

Less than half of the institutions specified a graduate degree as a requirement, however, based on this research, there is obviously an expectation that the CIO will have an advanced degree. Perhaps those conducting the CIO searches are attempting to gather as large a pool of candidates as possible by lowering the degree requirement while their expectations are higher. The institutions where there was no degree specified in the CIO vacancy advertisement were an Ivy League institution, a selective private doctoral institution and a technical college.

**Chart 32. Degree Requirements Listed in CIO Job Advertisement**
TL Degree Major

The top four degree majors for the TLs in 2010 were technology, business, education and administration, which comprised 70 percent of the responses (Chart 33). The 2009 survey results reflected the same top four majors, technology, business, education, and administration, although the individual percentages differed slightly from the 2010 results.

Chart 33. Degree Major

The majority of the TLs had a technology, business, education or administration major. Not surprisingly, 79 percent of TLs felt the major needed for the CIO role was business, technology or administration (Chart 34). Conversely, nearly half of the responding IMTs and CIOs felt the degree major was not important. However, the second leading degree-needed response from IMTs and CIOs was technology. These two answers, major is not important and technology, comprised 68 percent of the responses from CIOs (Chart 35) and 85 percent of the responses from the IMTs (Chart 36).
Chart 34. Degree Major Needed By CIO (TL)

- 31%: Education
- 26%: Technology and Business
- 10%: Engineering
- 2%: Other, please specify
- 2%: Not Sure
- 2%: Combination of Education and Experiences
- 1%: Doesn't Matter
- 1%: Administration
- 1%: Technology
- 1%: Business
- 2%: Depends on the Person
Indeed, the CIO position advertisements may support the CIO and IMT responses regarding the unimportance of a specific degree major in that 41 percent of the advertisements did not state a degree major preference (Chart 37). Although, 44 percent of the advertisements did list a computer-related major or an IT and/or business major preference.
In all of the previous CIO Studies conducted by Dr. Brown and CHECS, the attributes needed for a CIO to be perceived as effective by the institution management team have been consistent (Brown, 2006a, 2006b, 2008a, 2008b, 2009). According to those Studies, the CIO needed to have:

- Communication skills;
- IT knowledge;
- Political savvy;
- Business knowledge.

Examples of these attributes are displayed in Table 2 below.

**Table 2. CIO Attribute Examples**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills</td>
<td>Fluent in business language; fluent in higher-education language; able to communicate and present information to others without using technical terms.</td>
</tr>
<tr>
<td>IT Knowledge</td>
<td>Understands how IT is applied in the organization; able to use current IT resources to fill institutional requirements; uses new technology for the institution; familiar with the acquisition of IT.</td>
</tr>
<tr>
<td>Political Savvy</td>
<td>Able to assess situations that might be confrontational and act tactfully; able to work well with a majority of people.</td>
</tr>
<tr>
<td>Strategic Business Knowledge</td>
<td>Knowledge of institutional offerings; understanding of market and business processes; familiar with the competition.</td>
</tr>
</tbody>
</table>
TLs were asked to select, from a list of 19 skills, the five skills they believed were the most important for a CIO to possess. The TL responses were consistent with prior year’s responses. In the 2009 TL survey, the top five skills selected were leadership, communication skills, interpersonal skills, higher-education knowledge and planning. In 2010, those same skills were again named the top five attributes as well as in the same order as the 2009 responses (Chart 38). Technical knowledge, which had been listed in the sixth position in 2009, dropped to the eighth position in 2010; perhaps this change reinforces a view that TLs do not consider the CIO position to be a technical job.

**Chart 38. Skills Needed by the CIO (TL)**

In 2010, the IMT and CIO survey respondents were also asked to select the top five skills a CIO should possess. Chart 39 and Chart 40 depict the responses from the two groups. The IMT view of the top five skills in descending order were technical knowledge, communication skills, leadership, higher-education knowledge and interpersonal skills. The IMTs indicated that technical knowledge was the number one skill required with 77.22 percent of the responses, followed closely by communication skills with 76.11 percent. However, there was a 20 percent difference between communication skills and the next closest skill, leadership at 56.11 percent. While the CIOs responded with the same top five skills, the skills were ranked in a different order.
The CIOs indicated that communication and leadership, not technical knowledge, as a CIO’s top two skills. Technical knowledge, listed third, was separated by a 26 percent difference between it and leadership. There was clearly a difference of opinion between the TLs and the IMTs and CIOs on whether the CIO position required technical skills. The difference may have been a matter of defining terms. The TLs may have viewed technical skills as the ability to use a computer programming language while the IMT and CIOs may have viewed technical skills as the ability to understand how a system operates.

It is interesting to note that the top five skills listed by all three groups (TLs, IMTs, and CIOs) lined up with the attributes which are believed to have an impact on perceived-CIO effectiveness (that is, technical knowledge, higher education knowledge, communication skills, and political savvy) throughout the course of this study.

**Chart 39. Skills Needed by the CIO (IMT)**

- **Technical knowledge**: 77.60%
- **Communication skills**: 76.50%
- **Leadership**: 56.83%
- **Higher education knowledge**: 48.63%
- **Interpersonal skills**: 40.98%
- **Planning**: 31.69%
- **Management**: 27.32%
- **Change management**: 22.95%
- **Academic Computer Enterprise**: 22.40%
- **Enterprise Resource Planning**: 19.67%
- **Administrative Computing**: 14.21%
- **Budgeting**: 13.11%
- **Business Process**: 9.84%
- **Supervision**: 8.74%
- **Vendor management**: 8.20%
- **Business Knowledge**: 8.20%
- **Governance**: 4.92%
- **Finance**: 2.73%
- **Other**: 1.09%
In the CIO’s Absence

On-the-job training is an effective method to prepare for a new position. The percentage of TL respondents who became the lead technology person when the CIO was absent declined from 27 percent in 2009 to 23 percent in 2010 (Chart 41), while the response “Rotating the role when the CIO was absent” rose from 36 percent in 2009 to 38 percent in 2010. Those who did not want to be become a CIO and who filled in during the CIO’s absence rose from 16 percent in 2009 to 19 percent of the respondents in 2010 (Chart 42).
The 2010 CIO respondents were asked whether or not they had identified someone to serve in the CIO capacity during their absence; 59.08 percent indicated they had made that selection.
(Chart 43). Again, this on-the-job training approach would appear to be an ideal way for the aspiring CIOs to prepare for the CIO role.

**Chart 43. CIO - Have you Identified Someone to Serve as the CIO in your Absence?**

![Pie chart showing 59.08% Yes and 40.92% No]

**Salary Range**

Like many positions in other industries and career fields, the TLs’ salaries were as varied as the other attributes and conditions in this research. The percentage earning more than $100,000 per year was 48 percent (Chart 44). The single highest percentage (15 percent) earned within the $101,000 to $110,000 salary bracket.
All departments are governed by a budget and it is often a critical part of leadership roles. The TLs were managing significant budgets (Chart 45) with nearly 60 percent managing multimillion budgets and nine percent managing $10 million plus budgets. This responsibility combined with supervising large numbers of people will help prepare the TLs for the CIO role.

### Chart 45. Budget for all Respondents
SUMMARY

The technology leadership in higher education has a diverse background, but like other executive positions, it is not racially diverse. Additionally, gender diversity may also be lacking.

The TL has ascended to his or her position having come from many areas in the IT department, as well as from faculty and other areas. Similarly, the CIOs in 2010 came from a variety of backgrounds. Many CIOs held a faculty position in their last position as well as the position prior to the last one; and many had been CIOs in their last two positions.

Earning an advanced degree may be a prerequisite for the TL who wants to be competitive for the higher-education CIO position. Seventy-nine percent of the 2010 CIOs held an advanced degree, while only 64 percent of the TLs held an advanced degree. Moreover, more than 85 percent of the IMTs and CIOs (those who may have a weighted voice on hiring committees) indicated that an advanced degree was a requirement for the CIO position.

The degree major does not appear to be an important factor, according to the 2010 CIOs, IMTs and job advertisements, but if a major was important, technology may be one of the leading degree major preferences. A large percentage of TLs held a technology, business, education or administration major and felt those majors were important for a CIO.

There is clearly a disconnect between the TLs’ view and the view of CIOs and IMTs on which skills are critical for a CIO to possess. Technology was one of the top five skills listed by the CIOs and IMTs; however, TLs listed it eighth on their list of CIO skills. Conversely, the CIOs, IMTs, and TLs agreed that leadership, communication, interpersonal skills, and higher education knowledge were in the top five CIO skills. This difference may be a matter of semantics. The TL may have considered technical skills as the ability to program a network router or another task that was "hands-on" technical. While the IMT and CIO may have viewed technical skill as the ability to understand, at a high level, how technology works and could benefit the institution. On-the-job training was seen by the CIOs as a good way to prepare the future CIOs for the senior IT role and more than 50 percent of the CIOs were providing that opportunity. In the next section the potential CIOs of the future responses will be examined.
LEADERS OF TOMORROW

This section of the report examined those TLs who expressed a desire to become a CIO. To gather an inclusive perspective, this potential CIO group was contrasted with the group who indicated they did not want to become a CIO. The TLs’ reasons for both paths—to become or not become a CIO—were also examined. In addition, data from the 2010 CIO and IMT surveys was used to provide another perspective.

Career Plans
The percentage of those TLs who indicated they wanted to become a CIO declined from 69.37 percent in 2009 to 65.43 percent in 2010 (Chart 46). Of the 2010 group (65.43 percent), 13 percent predicted they would retire in the next 10 years, leaving 52 percent available to fill the CIO role (Chart 47). This percentage, which represented a pool of TLs who would be available to replace the retiring CIOs, was a decrease from 2009’s 59 percent of TLs who were both interested in becoming a CIO and would be available in 10 years.

Chart 46. CIO Career Plan
Timing of CIO Pursuit Effort

The group of TL CIO-aspirants (those interested in becoming a CIO) were asked to predict when they would begin actively pursuing the position. Eighty percent of that group believed they would be working towards the CIO position in the next five years (Chart 48). This percentage declined 6 percent from the 2009 responses.

Chart 48. Number of Years Until Concerted Effort to Become a CIO
Planning for Succession

Many TLs responded that the best preparation to become a CIO was the knowledge and skills gained through on-the-job experiences, such as those that might be found in succession planning. The aspiring CIO group was asked if they were serving in a position created to act as the CIO in that person’s absence. Of the group, 18.50 percent indicated they were serving in such a position (Chart 49). This percentage declined from 26.45 percent in 2009. It is interesting to note that 78 percent of the CIOs in the 2010 survey indicated that on-the-job training was second only to mentoring as the best method for preparing for the CIO position. This hands on approach to learning a role has been recognized as legitimate (Fitzgerald, 2008).

Chart 49. In a Position Created to Fill in For The CIO

Age
More than half of CIO-aspiring TLs were 45 years old or younger with the largest group in the 36-40 year-old bracket (Chart 50). The percentage of TLs interested in becoming a CIO who were older than 51 years old, 24.65 percent, was lower by 2 percent than the 2009 respondents. The percentage of the entire TL group that was older than 51 years was 33 percent.
Gender
The percentage of those who aspired to the CIO role who were female decreased from 27.92 in 2009 to 26.03 percent in 2010 (Chart 51). There was a marked difference between the percentage of women who wanted to become a CIO, 45 percent, and the percentage of men who wanted to become a CIO, 76 percent. If the two gender groups CIO aspirations continue to follow that trend the percentage of CIOs who are women may decrease from the already low percentage.
Chart 51. Gender of Those Who Want to be a CIO

Chart 52 depicts by age range the percentage of men and women who indicated they would like to become a CIO. The largest percentage of women who wanted to become a CIO was in the 46-50 year old range. The largest percentage of men who wanted to become a CIO was in the 36-40 year old range.

Chart 52. Gender and Age of Those Who Want to be a CIO
Reasons for CIO Position Pursuit
There are a variety of reasons (such as salary and natural career progression) that TLs may have for seeking professional advancement. The most frequently given reason for the TLs to pursue the CIO position was a desire to make a difference (Chart 53). The next closest response, 36 percent, was “next logical step” in their careers.

Chart 53. Reasons for CIO Position Pursuit

Reasons for not Pursuing the CIO Position
As depicted in Chart 54, the TL reasons for not pursuing the CIO position included “too close to retirement,” “not qualified” or “not interested.” These reasons provide some insight into this group's understanding or perception of the CIO role. For instance, the number one reason for not wanting to pursue the CIO position was because the job was seen as too political. The second highest response was the CIO job was too removed from technical work, an answer which makes sense when considering the TLs did not list technical knowledge as one of the top five skills needed by a CIO.
CIO Preparation Activities
The TLs who were interesting in pursuing the CIO position were asked what they were doing to prepare for the new job. The number one answer given by 70 percent of the respondents was on-the-job training (Chart 55). The second most frequent answer was being mentored. These two responses were also the top two answers in 2009. The third most frequent answer, 26.49 percent, involved education; the TLs indicated they were working on their next degree.

Of that percent who were working on an academic degree, 68 percent of them were working on a Master’s degree and 32 percent were working on a terminal degree. The TLs obviously recognize what this research has shown, an advanced degree is becoming a prerequisite to become a higher education CIO.
For another perspective, CIOs were also asked about the preparation activities for aspiring CIOs. Similar to the TLs, the CIOs gave the same two top answers except in reverse order (Chart 56). Eighty-six percent of the CIOs believed that in order to prepare for the CIO role, the TL had to be mentored by a CIO or another executive. This answer was followed closely by on-the-job training at 78 percent.
The percentage of TLs of who aspire to the CIO position with an advanced degree rose from 64 percent in 2009 to 69 percent in 2010 (Chart 57). The TL group obviously understood the importance of the advanced degree and made progress toward fulfilling that CIO requirement.

Chart 57. Degree Level For Those Who Want to be a CIO
**Mentoring**

According to the CIOs in the 2010 survey, on-the-job training and mentoring were two of the most important activities for the TL to prepare for the CIO role. The TLs who aspire to the CIO position were asked to select any number of options from a list of preparation assistance sources. The number one response to who was helping the TLs prepare for the CIO role was "no one" from 41 percent of the TLs (Chart 58). The answer "My CIO" was a close second most frequent answer at 40 percent.

**Chart 58. Preparation Assistance Sources**

When analyzing by gender the preparation-assistance-sources responses, the number one answer for women, at 42 percent, was "my CIO" followed by "no one" at 39 percent (Chart 59). In 2009, the number one answer for women had also been "my CIO". Forty-three percent of the male TLs number one answer for preparation assistance sources was “no one,” the same top response in 2009 (Chart 60). The number two response for men was “my CIO” at 39 percent.
Chart 59. Preparation Assistance Sources For Women

Chart 60. Preparation Assistance Sources For Men
Although CIOs had indicated that mentoring was the most important CIO preparation activity at 85.91 percent and on-the-job training was the second most important with 78.41 percent, only 51.84 percent of the CIOs in the 2010 survey were mentoring someone (Chart 61).

**Chart 61. CIO - Are You Mentoring Someone?**

The TLs who were being mentored for the CIO role were asked what mentoring preparation activity was being performed for them. The number one activity, at 44 percent, was "no activities at this time" (Chart 62). If 80 percent of the TLs are going to pursue the CIO job in the next five years, as they indicated in the survey, this answer may have to change if they are going to be prepared.

The second most frequently given answer was regular meetings with mentor at 43 percent. On-the-job training followed closely at 38 percent, echoing the answers to the question about the activities the two groups, the TLs and CIOs, thought someone should undertake to get ready for the CIO role.
The respondents who plan to become CIOs were asked three questions to assess their own readiness for an institution’s senior IT position (Table 3).

The first question queried the respondents on how prepared they thought they were right now to become a CIO. Answers were selected on a 0 to 4 scale, with 0 representing “Least Prepared” and 4 being “Prepared.” The average self-assessment for the respondents was a 2.7, indicating the respondents were approaching “Almost Prepared” for the CIO role.

The second question asked the IT leaders to rate their understanding of the CIO role on a scale of 0 to 4, with 0 representing “No Understanding at All” and 4 reflecting “Complete Understanding.” The average rating for the respondents was a 3.5, indicating an understanding of the CIO role between “Partially Understand” and “Understand Completely.”

The third question attempted to determine how much assistance the respondents believed they were going to need in order to be successful when they became a CIO. Again, the scale was from 0 to 4, with 0 indicating “No Assistance” was needed and 4 represented needing a “Great Deal of Assistance.” The average rating for the respondents was a 2.1, indicating the respondents would “Need Minor Assistance” as a CIO.
It should be highlighted that this was a self assessment. The TLs may not have a complete understanding of the CIO role or the challenges they will face as a CIO.

Table 3. CIO Role Self-Assessment

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared to Become a CIO Now</td>
<td>2.72</td>
</tr>
<tr>
<td>Understanding of CIO Role</td>
<td>3.58</td>
</tr>
<tr>
<td>Assistance Needed in CIO Role</td>
<td>2.15</td>
</tr>
</tbody>
</table>

Tenure

The higher-education CIO has consistently spent more time in his or her position than other members of the IMT, as this longitudinal study has shown year after year. The TLs in 2010 had also spent a number of years in his or her current position (Table 4). When analyzing the differences between those who aspired to the CIO position and those who did not, the tenure declines significantly for those who did aspire to the CIO position. Those who did not aspire to the CIO position had spent more than two years longer in their current position than those with CIO aspirations. This difference in time in current position could be related to the TLs who aspire to the CIO role changing jobs more often.

Table 4. Time in Current Position Comparison

<table>
<thead>
<tr>
<th>Aspire to Become a CIO</th>
<th>Time in Current Position (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4.6</td>
</tr>
<tr>
<td>No</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Summary

As higher education CIOs predicted retirement at a high rate, some of today's TLs were positioning themselves to step into the CIO role. The percentage of TLs who are interested in becoming a CIO and who will be available in 10 years should be sufficient to help with the impending CIO retirement challenge. Eighty percent of the TLs who expressed an interest in becoming a CIO stated they would begin pursuit of the position in the next five years. The percentage of women who indicated they wanted to become a CIO was significantly lower than their male counterparts. If that trend continues the percentage of CIOs who are women may decline. The majority of TLs stated their reasons for pursuing the CIO role were making a difference or next logical step in career. In contrast, the number one answer for not pursuing CIO job was that it was too political, which was followed by too removed from technical work. This sentiment that the CIO job is not technical was also expressed when the TLs selected...
technical skills as number eight from a list of 19 skills that CIOs needed. The IMTs and CIOs listed technical skills in the top five.

The CIOs and TLs both indicated that mentoring and on-the-job training were essential to preparing TLs to become CIOs. However, only 18 percent of the TLs were serving in positions created to act as the CIO in the CIO’s absence. While 51.84 percent of the CIOs indicated they were mentoring someone, the number one answer from TLs as to who was helping them prepare for the role was “no one.” Furthermore, the TLs who were being mentored listed “no activities” as the number one mentoring activity that was being done to prepare them for the CIO role. Clearly, these circumstances will have to change if TLs are to be adequately prepared for the complex CIO role.
CONCLUSION

The higher education TL has arrived at his or her position from a variety of positions across the IT department, faculty, and other areas just as the CIOs in 2010 also came from varied backgrounds. However, many of the CIOs had been a CIO in their last two positions. Like the TLs, many of the CIOs had been a member of the faculty in their last two positions.

The technology leadership in higher education has a diverse background, but like other technology positions, it is not racially diverse. Gender diversity was also lacking. Furthermore, the percentage of women who indicated they wanted to become a CIO was significantly lower than their male counterparts. If that trend continues the percentage of CIOs who are women may decline.

An advanced degree appears to be a minimum requirement for a higher-education CIO. If the TL wants to be competitive for this executive position, he or she may have to earn an advanced degree as it is an expectation among the higher-education management team members and among many CIOs. In 2010, 79 percent of the CIOs and 64 percent of the TLs held an advanced degree. Close to 90 percent of the IMTs and CIOs indicated an advanced degree was a requirement for the CIO position.

While an advanced degree is important, the degree major was not important, according to the 2010 CIOs, IMTs and CIO job advertisements. A large percentage of TLs held a technology, business, education or administration major and, moreover, felt those majors were important for a CIO.

Fifty-two percent of the TLs were interested in becoming a CIO and indicated they would be available in the next 10 years. The vast majority, 80 percent, of the TLs who expressed an interest in becoming a CIO stated they would begin pursuit of that position in the next five years.

There was clearly a disconnect between the CIO skills viewed as critical by the CIO and IMT and the skills the TL believes a CIO has to possess. Technology was one of the top five skills listed by the CIOs and IMTs, while it fell to number eight on the TLs’ list of CIO skills. Those TLs who were not going to pursue the CIO job indicated the role was too political or it was too removed from technical work. Those who wanted to become a CIO listed making a difference or next logical step in career as the overwhelming majority answer.

The TLs’ preparation for the CIO role is critical. On-the-job training was cited by the CIOs as a good way to prepare future CIOs for the senior IT role. In addition, 86 percent of the CIOs believed the TL had to be mentored by a CIO or other executive and over 50 percent of the CIOs indicated they were providing that mentoring opportunity. The TLs listed the same two activities, on the job training and mentoring as most important. In spite of the belief in on-the-job training, only 18 percent of the TLs were serving in positions created to act as the CIO in that person’s absence. Compounding this challenge, the number one TL answer as to who was helping them get ready for the CIO role was “no one.” Furthermore, those who did have a mentor indicated that the number one activity that was being done for them to help prepare for the CIO role was “no activity.”
The higher-education CIO role is very complex and there is a retirement wave coming in the next decade. There appeared to be enough TLs who were interested in pursuing the CIO role and in a timeframe close enough to mitigate the retirement wave, but they need help. The TLs, according to the CIOs who responded, will need mentoring and on-the-job training. Based on the TL and CIO responses, some of the TLs might not be getting the mentoring or on-the-job training needed to be successful in the CIO role.
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CHECS is a nonprofit organization dedicated to the education and development of the higher education chief information officer. It is an entirely volunteer organization and all studies are funded through report sales and through sponsor donations. In 2010, CHECS began funding a scholarship endowment to benefit higher-education technology management doctoral students at Nova Southeastern University.

CHECS was founded in 2009 by Dr. Wayne A. Brown to provide residence and funding for the continued studies focusing on higher education CIOs’ attributes, education, experience and effectiveness. The research is unique from other CIO studies in that it is a two-part study involving the CIO as well as other members of the institution management team. The annual study invites participation from the CIO (or lead technology person) at every two- and four-year higher education institution in the United States and CIOs internationally. Survey responses are analyzed in aggregate and statistical data is extracted and synthesized into annual reports: CIOs, technology leaders and two-year college CIOs. To date, the study was has been conducted six times since 2004. In 2009, CHECS launched a study focusing on future higher education CIOs (technology leaders who are not CIOs).

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