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Instructors' Experiences in the Cisco Networking Academy: Program Value and Teaching Strategies

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PREFACE

This White Paper is one in a series of reports that examines the success of students enrolled in the Cisco Certified Network Associate (CCNA) Program offered through the Cisco Networking Academy. For a list of available reports, see our Web site (www.indiana.edu/~iuteam).

The purpose of this white paper is to describe the findings from the CCNA Instructor Survey and the recommendations that arise from those findings. This paper describes the CCNA instructors in terms of demographics, and it identifies instructor satisfaction with the CCNA program, as well as the value instructors place upon various elements that make up the program. This paper also explores how instructors teach in the CCNA program, towards identifying their best teaching practices. Finally, the conclusion of this paper offers recommendations based on instructors' insights concerning how to improve the CCNA program.

The Cisco Networking Academy serves more than 400,000 students at almost 10,000 "academies" located in high schools, community colleges, universities, and non-traditional settings (e.g., career centers, correctional facilities, shelters, military bases) in more than 150 countries around the world. The CCNA program is the Academy's most popular program.

The Cisco Networking Academy offers a unique education model that combines a centralized curriculum with local control. The course and laboratory materials, the sequence of instruction, and the assessment system are all centrally developed by technical and educational experts working together with the support of Cisco Systems, Inc. All materials are delivered over the Internet, but courses are taught in the classroom by local instructors at each academy who are free to adapt the materials to their local context. Instructional quality is supported by initial instructor training and annual professional development, as well as by an online community of instructors and 24/7 technical support. The quality of instruction is monitored through student performance on the end-of-course exams and through student course evaluations – both of which are common to all courses.

The curriculum is an applied educational curriculum designed to meet the needs of practicing network engineers. It is designed to provide both deep conceptual understanding and practical skills. Indeed, the curriculum is aligned with teaching standards for United States high school math, science, and language arts education.

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www.ciscolearning.org



Instructors' Experiences in the Cisco Networking Academy: Program Value and Teaching Strategies

WHO ARE THE CCNA INSTRUCTORS?

The Cisco Certified Network Associate program is a series of four courses offered in a wide variety of traditional and non-traditional settings, including high schools, community colleges, universities, and community service organizations. The CCNA program is taught worldwide, and currently, 4,265 instructors teach in the CCNA program in the United States and Canada.

We surveyed 815 of the 4,265 CCNA instructors in the United States and Canada about their satisfaction with the program, their perceived value regarding various aspects of the program, and their teaching strategies. Of the 815 instructors who completed the survey, 45% teach in high schools, 46% teach in post-secondary institutions (both 2-year and 4-year colleges and universities), and 9% teach in non-traditional environments. This classification refers to the institution in which the CCNA program is offered rather than the type of degree or diploma program.

Education

At all three types of institutions offering the CCNA program, the majority of instructors hold master's degrees, with bachelor's degrees being the second most common (see Table 1). A modest percentage of instructors who teach in the CCNA program hold associate degrees; this group includes 10% of instructors at the post-secondary level and 13% of instructors at non-traditional institutions.

Most instructors have a master's degree.

TABLE 1. Highest degree obtained by instructors

Degree	High School	Post-Secondary	Non-Traditional
Ph.D.	1%	6%	3%
Master's	61%	56%	37%
Bachelor's	30%	25%	32%
Associate	5%	10%	13%
Other	3%	4%	16%

Professional Networking and Teaching Experience

While the majority of post-secondary instructors have considerable experience as networking professionals, most of the high school teachers have *no experience* working as a networking professional (see Table 2). Although networking experience is not required of CCNA instructors, it is likely to be a benefit to instructors in their preparation for classes and when dealing with both updates to the curriculum and errors in the course material.

The majority of post-secondary instructors have significant networking experience, but most high school teachers have no professional experience.

TABLE 2. Experience as a networking professional

	High School	Post-Secondary	Non-Traditional
No Experience	54%	21%	39%
Less than 1 year	6%	7%	2%
1-3 years	10%	17%	15%
4 years or more	31%	55%	43%

Across all three types of institutions, the majority of instructors have 10 or more years of teaching experience (see Table 3). These data indicate that the instructors who teach in the CCNA program are mature professionals who have greater than average teaching experience.

Most instructors who teach in the CCNA program have extensive teaching experience.

TABLE 3. Experience as a teaching professional

	High School	Post-Secondary	Non-Traditional
Less than 1 year	2%	1%	5%
1-3 years	6%	7%	5%
4-6 years	12%	21%	25%
7-9 years	10%	13%	10%
10 years or more	70%	58%	55%

Subjects Taught by Instructors

Almost all CCNA instructors teach courses outside the CCNA program. Not surprisingly, the type of course most frequently taught outside the program is computer technology (see Table 4). Professional courses (such as business and engineering) are the second most frequently taught subject area, while math, science, and statistics courses are the third most frequently taught subject area. For high school instructors, industrial arts courses are also taught by about 10% of CCNA instructors. Only a very small percentage of CCNA instructors teach social science or language courses.

TABLE 4. Subjects taught by instructors during the last 3 years

	High School	Post-Secondary	Non-Traditional
Computer technology (other than courses provided by Cisco)	48%	63%	55%
Science / Mathematics / Statistics	11%	9%	7%
Industrial arts courses	10%	2%	1%
Professional courses (e.g., business, engineering, nursing)	12%	1%	8%
Other	13%	10%	14%
Have not taught any other courses	6%	6%	13%

HOW VALUABLE IS THE CCNA PROGRAM?

Overall Program Satisfaction

All groups of instructors reported that they value the CCNA program and that they are satisfied with the program at an overall level (see Table 5). Differences that occur between instructor perceptions represent varying degrees of satisfaction. As Table 5 indicates, a large majority of instructors reported satisfaction with the overall program.

A large majority of instructors reported being satisfied with the overall CCNA program.

TABLE 5. Overall instructor satisfaction with the CCNA program

	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
Overall, I am satisfied with my teaching experience in this program	4.10	4.31	4.14	.23 (small)
I would choose to teach in this program again	4.19	4.43	4.26	.27 (small)
I would encourage others to teach in this program	3.90	4.20	4.09	.30 (medium)
Overall satisfaction rating scale mean score	4.06	4.31	4.16	.28 (small)

Scales: 1 = Strongly Disagree, 5 = Strongly Agree

We asked instructors about their overall satisfaction with teaching in the CCNA program. Though all groups of CCNA instructors report that they are highly satisfied with the program, there is a significant difference between the satisfaction level of high school instructors and that of post-secondary instructors, with high school instructors being less satisfied overall with the CCNA program than post-secondary instructors or non-traditional instructors. While these differences are statistically significant, it is important to recognize the magnitude, or

Instructors in high schools reported significantly less satisfaction with the CCNA program.

practical significance, of these differences. The practical significance of these differences for each survey item is shown in Table 5. Values less than .30 are considered small effect sizes and values larger than .80 are considered large effect sizes. Table 5 shows that the effect size for the differences among instructor satisfaction are small to medium.

The survey invited instructors to explain their satisfaction ratings. Instructor responses indicate that high school instructors tend to be less satisfied because (1) they are more frustrated with frequent changes in the CCNA curriculum and with errors in the online and printed material, and (2) they feel that the CCNA curriculum is too difficult for high school students. These frustrations may be greater for high school instructors than instructors in post-secondary institutions because, as noted previously, high school instructors have little or no networking experience and, therefore, they may find it more difficult and more time-consuming to make necessary adaptations or improvements to curriculum when it is needed.

Lower satisfaction of high school instructors is related to frequent changes in the curriculum, errors in online and printed material, difficulty level of course content, and instructors' lack of networking experience.

Overall Value of Instructor Support

Instructors were asked about the value of three key elements of the CCNA program: professional development, curriculum and resources, and technical support. As with the overall satisfaction levels, instructors generally rated all three of these elements as valuable (see Table 6). However, there were moderate differences in perceived value among high school instructors, post-secondary instructors, and non-traditional instructors.

All groups of instructors found value in the professional development experiences provided by the CCNA program; however, instructors in non-traditional programs found greater value in these experiences than high school and post-secondary instructors, who reported similar value.

All instructors valued the CCNA curriculum and resources, with high school instructors valuing the curriculum more than post-secondary instructors. This difference may be related to the fact that high school instructors have less experience as networking professionals and, therefore, rely more heavily on the curriculum materials, whereas post-secondary instructors have professional experience that may make them more critical of the curriculum and resource materials.

All instructors reported that they valued the technical support provided by Cisco, but high school instructors rated technical support as having less value than either post-secondary or non-traditional instructors did. Since high school instructors are likely to require more technical support than other instructors, they may be more critical.

High school instructors are likely to require more technical support and, therefore, may be more likely to be critical of the value of technical support to their teaching.

TABLE 6. Value of professional development, curriculum and resources, and technical support

	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
Professional Development	3.43	3.39	3.65	.31 (medium)
Curriculum and Resources	4.36	4.23	4.33	.20 (small)
Technical and Administrative Support	3.38	3.48	3.70	.38 (medium)

Scales: 1 = Not at all valuable, 5 = Extremely valuable

The next three sub-sections offer a more detailed discussion of instructor perceptions concerning the value of specific aspects of the three key elements of the CCNA program.

Value of Professional Development

All instructors highly valued the initial training they received concerning the CCNA curriculum and content (see Table 7). For other professional development items, instructors still perceive value, but at a somewhat lower level. Mentoring for new instructors has the lowest rating of perceived value, with high school instructors rating it lower than non-traditional instructors. Also worthy of note in Table 7 are the relatively low ratings for initial and continuing education related to teaching practices: instructors consistently rated professional development activities for teaching significantly lower than professional development for content.

Instructors value professional development activities but have concerns about the timing of the activities and the amount of time required for them.

TABLE 7. Value of professional development activities in the CCNA Program

Professional Development Activities	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
Initial training for curriculum / content (WHAT you teach)	4.14	4.13	4.32	ns
Initial training for teaching practices (HOW you teach)	3.33	3.30	3.59	ns
Continuing education / retooling for curriculum / content	3.64	3.62	3.83	ns
Continuing education / retooling for teaching practices	3.24	3.06	3.51	.39 (medium)
The online community of other instructors	3.34	3.19	3.38	ns

Scales: 1 = Not at all valuable, 5 = Extremely valuable

The survey invited instructors to explain why they valued or did not value the various program components. The instructors indicated that they most valued initial training and continuing education on content and curriculum because these experiences help them to maintain proficiency with the curriculum and its hands-on lab component. The face-to-face meetings for this training also provided valuable interaction with other instructors, enabling them to share their teaching experiences.

Although instructors value professional development activities, they also expressed concerns about the amount of time required for these continuing education experiences, and about the timing of these activities, which did not necessarily coincide well with academic calendars. Also, instructors expressed frustration with the fact that no credit is offered for CCNA professional development, in that such professional development credits could be used for promotion or raises in the same way that graduate course credits count toward promotion and raises for high school teachers.

Value of Curriculum and Resources

Instructors found all the curriculum materials and resources (except hardcopy textbooks) to be very valuable (see Table 8). Instructors rated hands-on lab activities at similar levels of value. One important difference is that high school instructors rated both the online tests and quizzes, and the simulations and e-labs as more valuable than did post-secondary instructors. The resource rated as least valued by instructors in the CCNA program is hardcopy textbooks. Instructors from all three types of institutions consistently rated this resource the lowest in their responses.

TABLE 8. Value of curriculum and resources in the CCNA Program

Curriculum and Resources	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
Online reading materials	4.26	4.22	4.45	ns
Hardcopy textbooks	3.16	3.52	3.63	.42 (medium)
Hands-on lab activities	4.47	4.49	4.51	ns
Online tests and quizzes	4.30	4.07	4.12	.26 (small)
Simulations and e-labs	4.44	4.15	4.25	.34 (medium)

Scales: 1 = Not at all valuable, 5 = Extremely valuable

Instructors explained that they value the CCNA courses' richness in hands-on activities, simulations, and e-labs, all of which, they feel, help students to better learn and remember the course content. Availability of the readings and curriculum online enables instructors and students to access the materials anytime and anywhere. At the same time,

some instructors value hardcopy textbooks because they are more convenient for reading. Instructors value online tests and quizzes because they make the logistics of testing easier.

Although the curriculum and resources are highly valued, instructors have several concerns about the actual curriculum material. Of foremost concern is the number of errors in the textbooks. Instructors commented that textbooks have a large number of typographical errors, that they do not follow the online curriculum, and that they are too expensive for some high school districts to afford.

The second prominent concern is the validity of tests and quizzes. Seventy-four instructors stated that online tests and quizzes ask about minuscule details of the curriculum rather than asking about general important concepts.

A number of instructors also expressed their concerns about the hands-on lab manuals. Specifically, 39 instructors believe that hands-on lab activities promote rote learning and do not challenge students. Also, some instructors report that errors in the lab manuals require that they revise the materials before sharing them with students.

Instructors are concerned about the validity of tests, which focus on minor parts of the curriculum rather than important concepts.

Value of Technical and Administrative Support

Instructors rated the technical and administrative support as “somewhat valuable” to “very valuable” (see Table 9). The 24/7 support provided by Cisco received the highest ratings. Instructors consistently rated the field quality assurance process (QAP) the lowest and found it significantly less than “somewhat valuable.” High school instructors valued the QAP process more than post-secondary instructors but less than non-traditional instructors. Instructors in post-secondary and non-traditional institutions rated the certification exams that are required for instructors who teach in the program as more valuable than high school instructors rated it.

TABLE 9. Value of technical and administrative support in the CCNA Program

	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
24/7 technical support	3.77	4.07	4.06	.28 (small)
Overall CATC support	3.51	3.57	3.72	ns
Overall Regional support	3.56	3.40	3.82	.37 (medium)
Field Quality Assurance Process (support visits, reports, etc.)	2.85	2.76	3.23	.41 (medium)
Certification exams required to teach	3.22	3.60	3.67	.38 (medium)

Scales: 1 = Not at all valuable, 5 = Extremely valuable

Instructors explained that the 24/7 technical support was the most valuable because of its availability and because the responses they received were generally very helpful. Instructors also indicated that they value the support provided by CATCs and RTCs, with Regional support receiving the most positive comments. Although instructors commented that RTCs are very helpful to them when they have problems with the program or equipment, instructors rated the 24/7 support as having greater value than Regional support. A significant difference with a moderate effect size is observed between 24/7 technical support and Regional support.

Instructors highly value the 24/7 technical support because of its availability and the helpful responses they receive.

Instructors rated instructor recertification as generally valuable. Several instructors stated that recertification is necessary for teaching in such a rapidly changing subject area, and that recertification helps instructors to gain students' respect. Other instructors expressed concerns about the recertification exams, such as the lack of available funding to take the exam and the short life span of the certification. As Table 9 shows, high school instructors rated the recertification exams as less valuable. Additionally, some instructors questioned the value of certification as compared to teaching experience, implying that recertification should not be necessary for experienced instructors.

Finally, some instructors expressed concerns about the field quality assurance process (QAP) because they did not find the QAP experience helpful. Reasons given by instructors for their low perceived value of the QAP process are that there was not enough feedback provided during the experience and that personnel who conducted the QAP process did not seem to be appropriately qualified to evaluate their programs.

Instructors do not find the quality assurance process to be helpful because of the lack of appropriate personnel and the lack of feedback.

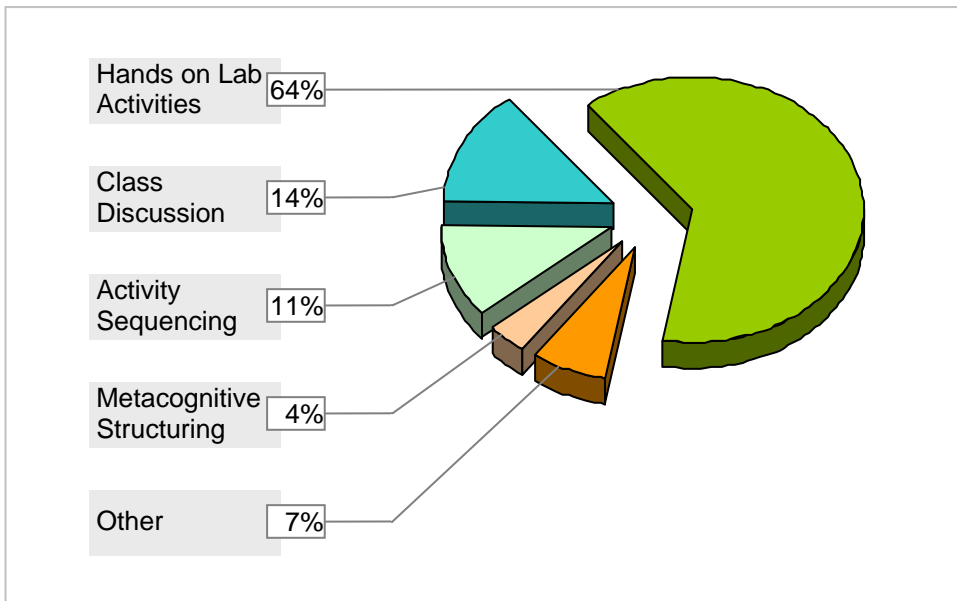
HOW DO INSTRUCTORS TEACH?

The Most Important Teaching Strategies

Teaching in the CCNA learning environment is different than teaching in the more traditional K-12 and higher education environments. This difference is due to the structural differences in the program and the nature of the program content.

It is important to understand the best teaching practices in this new environment because this information can be used to better support the instructors. To learn about best teaching practices, we asked instructors to describe the most important teaching strategy they use to help students learn. Instructors described four principal instructional strategies as being most important to student learning: (1) hands-on lab activity, (2) class discussions, (3) activity sequencing, and (4) metacognitive structuring (see Figure 1). We discuss these below in order of most frequently to least frequently mentioned.

FIGURE 1. Most important teaching practices



Hands-on labs with small group discussion, questioning, and lab work follow-up

Hands-on lab activity was the teaching strategy most frequently mentioned by instructors as being the most important to student learning. Sixty-four percent of the instructors stated that engaging in hands-on activities helps students better understand and remember content.

Instructors also identified specific tactics that they employ for hands-on activities. A common strategy was to demonstrate how to do a lab task and then have students perform the same task. Additionally, some instructors place students in small groups and have students work on tasks together, and thus, teach each other. During or after the lab tasks, instructors ask probing questions related to the lab tasks to stimulate student thinking. After students complete the lab tasks, instructors follow up on student learning by providing the means for students to reflect and report on the tasks that they have just completed.

Instructors also reported that they simulate troubleshooting and set up lab equipment in order to go beyond the procedural steps that are taught in lab tasks and to help students to engage in higher order thinking skills. Instructors use strategies such as creating a problem with equipment and asking students to solve the problem, or having students set up lab equipment from scratch.

Instructors find four basic strategies to be effective for teaching CCNA courses:

- hands-on lab activities,
- class discussion,
- activity sequencing, and
- metacognitive structuring.

Many instructors stated that hands-on activities help students to understand and remember content better.

Instructors challenge students by creating scenarios in which students must troubleshoot problems or set up lab equipment.

Class discussions

The second most frequently mentioned teaching strategy is small group and large class discussion. During the small group discussions, instructors provide students with a scenario in which they must solve a problem, or instructors have students discuss the topics of the week and present them to the class to share their insights with their classroom peers.

In large group discussions, instructors focus on solving problems with students, questioning students, and debriefing chapters, labs, and tests.

Activity sequencing

A number of instructors stated that their best teaching strategy is one in which they follow a specific sequence of teaching activities. The sequence usually begins with lecturing to the students, then moves to demonstrating tasks, and ends with having students conduct the labs. These instructors find activity sequencing to be the strategy that most helps students to learn the type of content in the CCNA program.

Metacognitive structuring

A number of instructors described the use of metacognitive structuring as an important strategy for teaching in the CCNA program. Metacognitive structuring is a teaching strategy that aims to help learners engage in higher-order thinking, which enables them to take control of their thinking and learning processes. General examples of metacognitive strategies include teaching students to use study strategies, to engage in structured questioning for problem solving, to use mnemonic devices for memorization, and to create action plans for transfer of learning to the workplace. Several instructors provide students with metacognitive help through study guides, worksheets, or teacher-prepared materials to facilitate learning and retention.

Time Spent on the CCNA2 Course

In general, instructors reported that they spend more time preparing for CCNA classes than for their other (non-CCNA) classes (see Table 10). Specifically, the time spent on preparations before the term begins and the time spent preparing for lab sessions are both significantly greater than for other courses that instructors teach at their institutions. However, providing feedback on students' academic progress and grading student work are two areas in which instructors reported

In general, instructors in all groups report spending more time preparing for CCNA classes than other classes.

spending the same amount of time or less time than for non-CCNA classes.

A significant difference in time spent on educational activities was found for three areas: preparations before the term begins, preparation for classroom sessions, and preparations for lab sessions (see Figure 2). In all three areas, instructors in high schools reported spending significantly more time than instructors in post-secondary institutions; this difference represents a moderate effect size.

TABLE 10. Time spent on CCNA course activities relative to other course activities

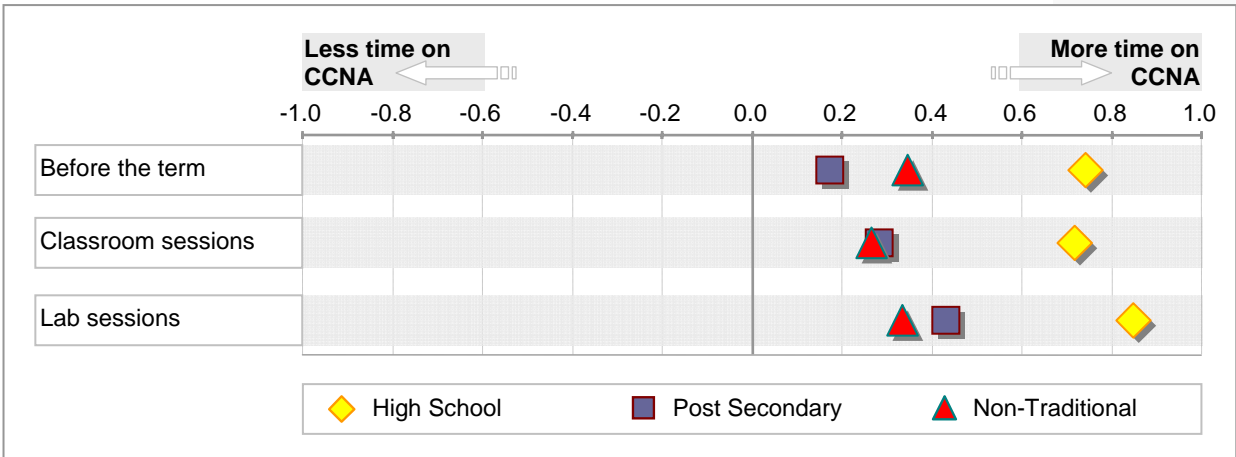
	High School	Post-Secondary	Non-Traditional	Cohen d Effect size
Time spent preparing before the term begins	3.81	3.20	3.45	.53 (medium)
Time spent preparing for classroom sessions	3.78	3.31	3.34	.45 (medium)
Time spent preparing for lab sessions	3.97	3.51	3.49	.38 (medium)
Time spent grading student work	2.62	2.40	2.51	ns
Time spent providing feedback to students on their academic performance	3.15	2.97	3.10	ns
Time spent mentoring students on their academic and career plans	3.46	3.30	3.11	ns

Scales: 1 = Much less time on CCNA, 5 = Much more time on CCNA

Figure 2 shows the difference scores between the items for time spent on course preparations. Instructors reported that for the CCNA course, they spent more time on preparations before the term begins, on preparations for classroom sessions, and on preparations for lab sessions. Furthermore, high school instructors spent significantly more time than other CCNA instructors. These differences are of medium effect size.

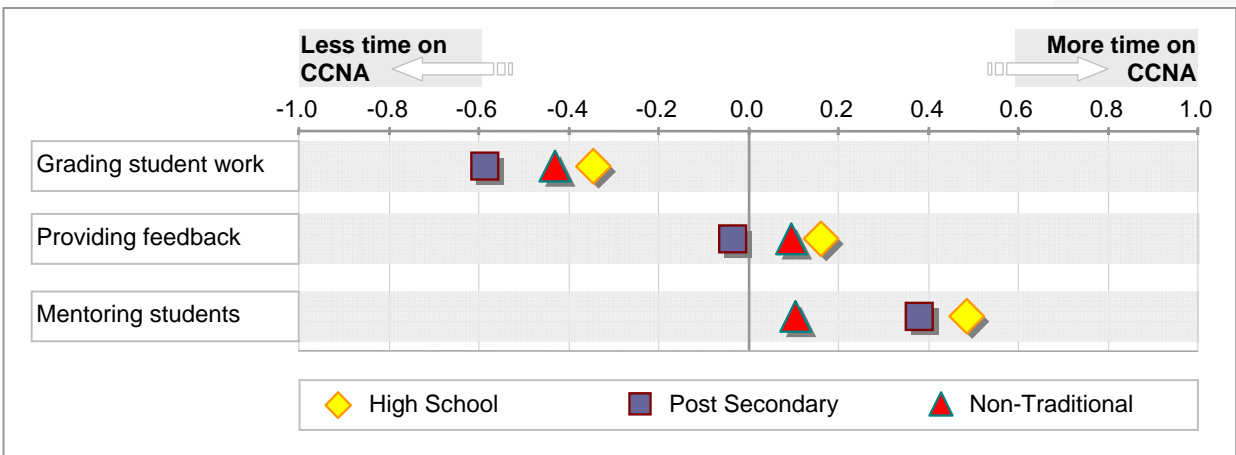
High school instructors spend more time than post-secondary instructors in all areas of course preparation.

FIGURE 2. Differences in amount of time for course preparation



Instructors reported that they spent comparatively less time for CCNA courses than for traditional courses on grading student work; they spent a similar amount of time on providing feedback to students about their work; and they spent somewhat more time mentoring students in CCNA courses than in traditional courses (see Figure 3). As figures 2 and 3 indicate, high school instructors take longer to prepare for CCNA courses than other instructors, but they spend the same amount of time as other instructors in grading, providing feedback, and mentoring students in CCNA courses.

FIGURE 3. Differences in amount of time for student academic progress



The survey asked instructors to explain why they spent more or less time on CCNA courses as compared to other courses. Instructors who spent *more* time on CCNA courses provided a wide variety of reasons. The most frequently reported reasons are as follows. First, some instructors perceive the course content as challenging for students and therefore, spend more time preparing to teach.. Second, instructors who are less familiar with the topics in CCNA courses spend more time in preparation. Third, changes and updates in the curriculum require instructors to spend time updating their knowledge and their lesson plans for teaching CCNA classes. Fourth, errors in curriculum and lab materials require that instructors spend more time preparing for classes in two ways: reviewing materials to check for errors, and correcting existing material or preparing additional material. Finally, some instructors spend more time on CCNA courses to ensure that students are prepared for CCNA certification exams.

Those instructors who reported spending *less* time on CCNA courses than traditional courses provided three main reasons: familiarity with the content, online testing, and online curriculum. After instructors gain experience and familiarity with the course content, it takes them less time to prepare for their classes. The online testing and immediate feedback features of the curriculum saves time for instructors and enables them to focus more on teaching and mentoring students. Additionally, the teaching material and resources provided by the CCNA program decreases the amount of time required to prepare the courses.

CONCLUSION

The findings of this study revealed that there are important differences among the instructors who teach CCNA courses in high school, post-secondary, and non-traditional institutions in terms of their content knowledge and their teaching experience. Instructors in post-secondary institutions (2-year and 4-year colleges and universities) have extensive experience as networking professionals, whereas more than half of the high school instructors have none. In contrast, high school instructors have extensive teaching experience, while post-secondary and non-traditional instructors have less teaching experience. Most post-secondary instructors specialize in computer technology courses, whereas more than half of the high school instructors specialize in subjects other than computer technology.

Instructors from all three types of institutions are highly satisfied with the CCNA program overall. However, high school instructors are significantly less satisfied than non-traditional and post-secondary institution instructors. The majority of high school instructors do not have advanced networking experience, and more than half teach non-computer technology related courses. Thus, the frequent updates in the CCNA curriculum and the high difficulty level of content for high

Errors in curriculum and lab materials require instructors to spend extra time preparing for class.

school students tends to reduce the satisfaction of the high school instructors with the program.

Overall, instructors highly value three key elements of the CCNA program: they place the most value on curriculum and resources, but also highly value professional development activities and 24/7 technical support.

Instructors reported that the four most important strategies for teaching CCNA courses are questioning and debriefing lab work; class discussions involving small groups with large group debriefing; providing metacognitive support for CCNA materials; and using a sequence of activities that includes lecture, demonstration, and labs. It should be noted that these four strategies are all activities that require significant interaction between instructors and students, and that these strategies require considerable instructor preparation. These activities would be difficult to include in a fully online instructional environment.

Instructors spend more time on teaching activities in CCNA courses than other courses they teach. However, instructors spend less time grading student work and providing feedback for student academic progress in CCNA courses. High school instructors spend more time than post-secondary instructors on preparing to teach CCNA courses.

Although the content provided for the CCNA program is the same for all participating institutions, instructors in these institutions are demographically and professionally different from each other.

Post-secondary instructors are more satisfied with their teaching experience in the CCNA program than high school instructors are. These instructors have better content knowledge, more hands-on networking experience, and more mature students than high school instructors. Nevertheless, an opportunity to better support post-secondary instructors is indicated by the finding that these instructors are less satisfied than other instructor groups with the continuing education for teaching strategies that is provided by the CCNA program. Given that post-secondary instructors have much less teaching experience than high school instructors, it follows that they would benefit from more pedagogical support than other instructor groups do.

When compared to post-secondary instructors, high school instructors are less comfortable teaching in the CCNA program because they have less content knowledge, less hands-on networking experience, and less mature students. The findings from the CCNA Instructor Survey clearly indicate that high school instructors need more content-based professional development experiences than post-secondary instructors do. Additionally, because textbooks are a source of content knowledge, high school instructors highly value textbooks as a resource for the CCNA program and are frustrated with the errors that are found

The teaching strategies that were identified by instructors as most important would be difficult to include in a fully online instructional environment.

Post-secondary instructors need more pedagogical support than other instructor groups do.

High school instructors need more content support than other instructor groups do.

in these materials; thus, these resources need to undergo more rigorous quality assurance.

The results of the CCNA Instructors Survey clearly indicate that high school instructors and post-secondary instructors represent different groups who need different types of support systems. However, the findings also indicate that the concerns of these groups overlap in an important area – in their expressed desire for the CCNA program to be better aligned with academic calendars. Both the post-secondary and the high school instructor groups pointed out the need for CCNA professional development experiences to be offered at times that fit into the academic calendar, so that instructors have a better opportunity to take advantage of them. Similarly, instructors also indicated that it is important to time curriculum updates so that they, too, are better aligned with school calendars.

All instructor groups express a desire that the CCNA program be better aligned with academic calendars.