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Instructors' Experiences in the Cisco Networking Academy: International Analysis

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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 present findings from the analysis of data collected through the CCNA International Instructor Survey. We describe several demographic characteristics of CCNA instructors in 12 regions throughout the world. We explain instructor satisfaction ratings for the CCNA program by identifying the value that instructors place upon various elements that make up the program. We also discuss the teaching practices of instructors, and identify instructors' perceptions about the most important teaching practices they use for the CCNA program. Finally, the paper explains instructors' perceptions about the value of applying the CCNA model to more traditional classroom settings.

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



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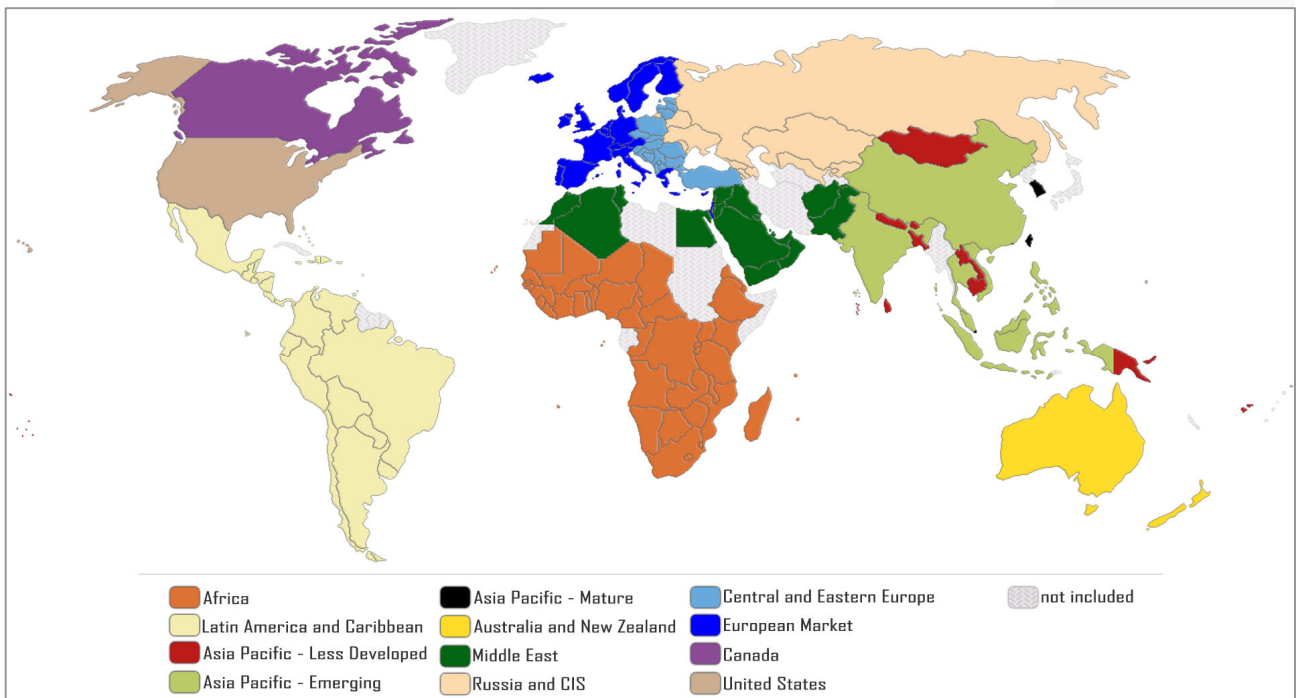
CCNA INTERNATIONAL INSTRUCTOR SURVEY PARTICIPANTS

The Cisco Certified Network Associate (CCNA) program is a series of four courses offered worldwide in a variety of traditional and non-traditional settings, including high schools, community colleges, universities, and community service organizations.

The CCNA courses are taught in more than 150 countries which are grouped into 12 regions (see Figure 1). Although Japan was one of these regions, it was not included in our analysis due to insufficient data. Australia and New Zealand were pulled out of the Asia Pacific - Mature region and into their own region based upon language preferences and cultural differences. We also report the data for Canada and the United States separately, even though they are in the same region, because the United States data have been previously reported and may serve as a comparative for other regions. A list of the countries corresponding to the 12 regions included in this report is provided in Appendix 1.

CCNA courses are offered in more than 150 countries in 12 regions.

FIGURE 1. Regions included in this report



The administration period for the CCNA International Instructor Survey began February 14, 2005 and ended November 1, 2005. All instructors who were actively involved with the CCNA program worldwide during that period were invited through an email and alert messages to complete the survey, which was accessible from the CCNA program homepage. The development of the instructor survey was a result of an iterative process of literature review, discussions, validations, pilot tests, and revisions. The survey included both closed-ended and open-ended questions. The closed-ended questions measure responses on a 5-point Likert scale (e.g., strongly agree to strongly disagree). The survey was offered only in English, which is a limitation of this survey.

Of the 17,000 active CCNA instructors worldwide, 2,105 from the 12 regions in this study completed the survey, for a response rate of 12.5%. Table 1 shows the number of instructors who responded to the survey and the number of academies represented. It also shows the percent of eligible instructors within each region who chose to respond to the survey. We have no statistical data to determine if the demographics of our sample match the demographics of our population. However, the response rates suggest that, for most regions, the survey data should be reasonably representative of the instructor population in those regions. However, the low response rates from Latin America and Caribbean, Asia Pacific - Mature, and Canada suggest that the conclusions drawn for these regions should be interpreted with care because less than 10% of the instructors from these regions completed the survey.

Worldwide, 2,105 instructors were surveyed with about a 12% participation rate.

TABLE 1. Instructor Participation Rates by CCNA Region

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Total
Number of academies	69	122	20	146	22	61	64	18	127	400	35	690	1774
Number of instructors who completed survey	86	147	23	198	26	80	76	23	162	455	45	784	2105
Percentage response rate	18%	6%	18%	14%	5%	14%	17%	16%	12%	10%	9%	16%	12%

Note: This table shows the number and average percentage of eligible instructors who chose to respond to the survey. Not all instructors answered all questions, so the actual number of instructors responding to individual survey items varies from table to table.

When making judgments based on data from the tables in this report, it is also important to keep in mind the total number of instructors responding from each region. In some regions there were only a small

number of responses for a particular survey item. When fewer than 10 instructors in a particular region responded to a particular survey item, the table column in which data is presented for that region is marked as “insufficient data” because the conclusions based on these numbers could be misleading.

Demographic data collected from the instructors who participated in this study indicate that the majority of instructors in all regions have extensive professional networking experience, with more than 50% of instructors reporting that they have at least 1 to 3 years of experience (see Table 2). On the other hand, almost half of the instructors from Canada, about 40% of instructors from Australia and New Zealand, and a third of the instructors from the United States reported have no professional networking experience. In other regions such as Africa and the European Market, roughly one-quarter of instructors reported having no professional networking experience.

A large percent of instructors from Canada, and Australia and New Zealand regions have no professional networking experience.

TABLE 2. Experience as a Networking Professional

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
No Experience	24%	8%	INSUFFICIENT DATA*	20%	0%	41%	0%	INSUFFICIENT DATA*	13%	27%	46%	36%	29%
Less than 1 year	12%	8%		12%	0%	7%	22%		6%	7%	0%	6%	7%
1-3 years	38%	26%		35%	40%	13%	39%		31%	21%	8%	14%	20%
4 years or more	26%	58%		33%	60%	39%	39%		50%	45%	46%	43%	44%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

The vast majority of instructors in all regions have considerable teaching experience; however, the range of experience does vary, with the least experienced group of instructors found in Africa, where 47% of CCNA instructors have less than three years of teaching experience, and the most experienced group in Canada, where 89% of instructors have 7 years or more of professional teaching experience (Table 3).

The most inexperienced teachers are from Africa, and the most experienced are from Canada.

TABLE 3. Experience as a Teaching Professional

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Less than 1 year	6%	4%	INSUFFICIENT DATA *	8%	0%	2%	9%	INSUFFICIENT DATA *	11%	2%	0%	2%	3%
1-3 years	41%	28%		23%	0%	5%	13%		34%	10%	0%	7%	12%
4-6 years	32%	30%		27%	40%	16%	30%		19%	26%	12%	18%	22%
7-9 years	3%	15%		15%	10%	5%	35%		11%	15%	12%	12%	13%
10 years or more	18%	23%		26%	50%	71%	13%		24%	46%	77%	61%	50%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

INSTRUCTOR SATISFACTION WITH THE CCNA PROGRAM

Table 4 clearly indicates that instructors from all regions are highly satisfied with the overall CCNA program. Although instructors in all regions are satisfied with the program, instructors from the United States and Asia Pacific - Mature regions have the lowest satisfaction when compared to other regions. These two regions provide opportunities to improve on instructors' perceptions of the program.

TABLE 4. Overall Satisfaction with the Program

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Overall satisfaction with the program	100%	98%	100%	96%	79%	98%	99%	96%	98%	94%	93%	83%	91%

Note: Percent of instructors who indicated that they were satisfied or very satisfied with the CCNA program

VALUE OF PROGRAM SUPPORT

We asked instructors to rate the value of key CCNA program elements that support teaching and learning on a five point scale. The areas rated included professional development (Table 5), curriculum and materials (Table 6), and technical and administrative support (Table 7).

Tables 5, 6, and 7 show the percentage of instructors within each region who rated these key CCNA program elements as either valuable or very valuable. When comparing these percentages, we see some interesting patterns regarding instructors' satisfaction with the various elements that make up the CCNA program. Just as instructors from all regions had high overall program satisfaction rates, instructors from all regions rated the majority of program support items as being valuable for teaching and learning activities. However, there are important differences between the value ratings for several items that highlight variation between the regions.

Instructors from all regions rate program support as being valuable for teaching and learning.

For instructor professional development (Table 5), in almost all cases at least 50% of the instructors rated each aspect of professional development as valuable or very valuable. Overall, greatest satisfaction was with the initial content training and the least satisfaction is with the online community. However, there are important regional differences. Overall, instructors from the United States, Canada, and Australia and New Zealand were least satisfied with their professional development. The contrast is particularly striking for the initial training in teaching practices where these three groups report 45%, 30%, and 53% satisfaction in comparison to satisfaction levels of 68% to 96% in the other regions. These data suggest that there is a program-wide opportunity for improvement of professional development if ways can be found to make the online community more relevant and meaningful to CCNA instructors and that overall, the professional development programs and opportunities for instructors from North American, and Australia and New Zealand should be evaluated.

The contribution of the online community was rated less valuable than other program items.

TABLE 5. Professional Development

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Initial content training	100%	91%	96%	91%	75%	85%	87%	77%	90%	84%	78%	79%	84%
Initial teaching training	84%	85%	87%	87%	71%	53%	85%	68%	73%	63%	30%	45%	62%
Continuing content education	88%	87%	96%	89%	79%	73%	81%	77%	86%	76%	62%	59%	73%
Continuing teaching education	81%	84%	83%	86%	67%	47%	74%	64%	79%	61%	40%	40%	59%
Online community	61%	53%	65%	70%	50%	41%	52%	41%	49%	43%	42%	39%	46%

However, it may simply be that instructors in the United States, Canada and Australia and New Zealand, who indicate that both initial and

continuing teaching training on how to teach the CCNA courses is not valuable, whereas instructors from other regions see these items as valuable for their teaching and learning. One possible explanation for these ratings may be that instructors in the United States, Canada, Australia and New Zealand have higher expectations about CCNA professional development because they have received professional teaching training from other high quality, well-established programs.

Continuing teaching training was rated low in the United States, Canada, and Australia and New Zealand regions.

Overall, high percentages of CCNA instructors in all regions indicate that they find the curriculum and teaching materials to be valuable (see Table 6). About 90% of the instructors from each region rated these items as valuable or very valuable for their teaching and learning activities. The one exception is the hardcopy textbooks, which are rated relatively low across all regions. The highest rating for hardcopy texts is from the Asia Pacific - Mature region at 79%, while the value rating from American and Canadian instructors is less than 50%. As was explained in previous instructor reports, factual and grammatical errors in the textbooks may be explanations for these relatively low ratings.

Hardcopy textbooks are always rated relatively less valuable compared to the other materials.

TABLE 6. Curriculum and Materials

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Online reading materials	96%	94%	91%	93%	75%	94%	91%	91%	93%	91%	91%	83%	89%
Hardcopy textbooks	71%	68%	65%	77%	79%	68%	75%	59%	56%	66%	43%	48%	60%
Hands-on lab activities	95%	95%	91%	93%	92%	96%	97%	96%	95%	91%	84%	90%	92%
Online tests and quizzes	97%	90%	96%	88%	88%	89%	85%	96%	87%	86%	80%	80%	85%
Simulations and e-labs	96%	95%	96%	92%	88%	81%	94%	86%	84%	85%	80%	84%	86%

Instructor ratings of technical support (Table 7) were more variable and relatively lower than instructor ratings of the professional development and curriculum and materials categories, indicating that technical support is an issue that should be studied closely by regional managers to determine what needs exist within each region. Ratings for the value of overall CATC support shows variations from region to region, with instructors from Asia Pacific - Mature, Australia and New Zealand, European Market, and Canada rating CATC support much lower than other regions. Fewer than 40% of the instructors from the Asia Pacific - Mature region rated most technical support items as valuable or very valuable.

Technical support is an issue that should be studied closely by regional managers.

TABLE 7. Technical and Administrative Support

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
24/7 technical support	80%	74%	83%	76%	33%	64%	79%	55%	64%	56%	65%	69%	67%
Overall CATC support	75%	55%	78%	67%	29%	48%	60%	64%	56%	47%	44%	55%	55%
Overall Regional support	73%	66%	70%	75%	44%	63%	55%	50%	67%	58%	52%	55%	60%
Field Quality Assurance Process	66%	64%	61%	68%	38%	30%	55%	59%	54%	38%	26%	29%	42%
Certification exams to teach	84%	76%	78%	79%	71%	72%	79%	86%	77%	72%	56%	50%	65%

Interestingly, instructor ratings for 24/7 technical support were highly variable across regions, though one might expect that this item is centrally administered. If 24/7 technical support is delivered from a centralized location, the variability in value ratings may indicate that service agents may not be considering differences in cultural norms when they provide support for various regions.

One final item that deserves attention in this category is the rating of the Field Quality Assurance Process, which had the lowest overall value ratings at 42% and a high degree of variability across regions compared to other items in this category.

As these tables show, at an overall level, instructors from all regions highly value the support they receive for the CCNA program. While certain items show consistent value ratings across regions, there are variations for valuing the support items within regions, and these items should be closely studied to determine what improvements can be made on a regional basis.

INSTRUCTIONAL ACTIVITIES IN A TYPICAL CLASS

We asked instructors what teaching activities they utilize in a typical class period. Instructors were provided with a list of 12 instructional methods and asked to select up to 6 instructional activities that they use most frequently. The utilization frequency of each method is listed in Table 8. Looking at the practices across and within the regions helps to identify the common patterns for utilization of instructional methods in a typical class period as well as variations across regions.

Regardless of region, the four most commonly used instructional methods are lecture, hands-on activities, demonstration, and testing. All

- Most frequently used activities:
- Lecture
 - Hands-on activities
 - Demonstration
 - Testing

four of these activities are utilized in a typical class by more than 50% of the instructors in all regions. Lecture and hands-on activities may be considered the primary teaching methods in the CCNA courses, as they are used by 75% of all instructors in a typical class.

While percentages for usage of the 12 instructional methods are distributed relatively equally across all regions, instructors from Central and Eastern Europe use individual student work, review of test results and whole class discussions far more than instructors from any other region. Similarly, instructors from the Middle East use the small group work method more than other regions.

TABLE 8. Activities in a Typical Class Period

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Lecture	73%	71%	INSUFFICIENT DATA*	76%	72%	84%	78%	INSUFFICIENT DATA*	68%	70%	65%	76%	74%
Hands-on activities	61%	58%		76%	67%	84%	66%		74%	70%	81%	78%	74%
Demonstration	48%	68%		59%	50%	47%	59%		62%	50%	58%	50%	53%
Testing	46%	53%		48%	44%	63%	66%		68%	52%	58%	56%	55%
Individual student work	41%	27%		35%	39%	45%	50%		58%	47%	46%	42%	43%
Online simulations/games	18%	23%		36%	28%	23%	13%		16%	15%	19%	25%	23%
Other activity	9%	14%		3%	6%	7%	3%		3%	9%	8%	11%	9%
Review homework	18%	17%		18%	11%	29%	13%		15%	12%	23%	18%	17%
Review test results	30%	35%		35%	22%	31%	31%		55%	31%	35%	33%	34%
Small group work	27%	27%		36%	33%	18%	47%		38%	39%	35%	24%	30%
Student presentation	41%	27%		26%	6%	2%	25%		20%	15%	8%	7%	13%
Whole class discussion	30%	47%		40%	33%	27%	34%		61%	36%	31%	32%	36%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

An interesting pattern is evident regarding the use of student presentations. While utilization of student presentations is relatively low across regions, it is even lower in relatively more developed regions

such as Asia Pacific - Mature, Australia and New Zealand, Canada and the United States.

The findings identified above regarding instructors' utilization of instructional methods in the program indicates that lecture, hands on activities, demonstration, and testing are favored by the instructors and student presentations are the least used teaching practices. One possible explanation for this might be that the CCNA teacher support materials and professional development activities encourage instructors to use these four methods in their classes. At the same time, the variations in use of teaching methods across regions may be indications of cultural differences that exist between school systems and evidence of differing expectations of teaching and learning within these different school systems.

THE MOST IMPORTANT TEACHING PRACTICES

Instructors were asked in an open-ended survey item to identify the teaching practices that they believe provide the most help in fostering their students' learning. In this question, instructors were asked to provide only one answer that best represented what they believed to be most important teaching activity for their students' learning. Instructors' answers to this question show a consistent pattern in all 12 CCNA regions.

Table 9 shows that more than 50% of the instructors in most regions stated that hands-on activities are the most helpful teaching method to foster their students' learning. Instructors also identified specific tactics that they employ for hands-on activities. For example, a common strategy used by instructors is to demonstrate a lab task, have students perform the task, and then follow up by providing opportunities for students to reflect and report on the task they just completed. Some instructors also reported that they simulated troubleshooting (beyond the traditional labs) to help students to engage in higher order thinking skills.

Following hands-on activities, class discussions (both small group and large class discussions) were identified as the second most helpful activity. 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.

The third most helpful activity chosen by instructors was activity sequencing. 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

Variations exist out of cultural differences or differing expectations.

Demonstrate, then have students perform the same task, is a common hands-on strategy.

Instructors go beyond lab procedures to promote higher order thinking skills.

Scenario and topic based discussions are utilized by the instructors.

Activity sequencing is an important activity to a number of instructors.

be the strategy that most helps students to learn the type of content in the CCNA program. Activity sequencing is likely perceived as valuable because it may help instructors to develop an instructional experience that is greater than the sum of its parts by creating connections and synergy between all instructional activities.

Based on the previous section in which instructors ranked lecture as one of the most frequently used instructional strategies, one might expect that lecture would also be ranked by instructors as one of the most important teaching activity. Only a small number of instructors in eight regions identified lecture as one of the most helpful methods for students' learning, which may indicate that instructors perceive lecture as a necessary instructional activity, but one that is not sufficient by itself to facilitate students' learning.

TABLE 9. Teaching Practices Most Important for Student Learning

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Hands on Lab Activities	42%	49%	INSUFFICIENT DATA *	49%	55%	67%	55%	INSUFFICIENT DATA *	56%	57%	67%	64%	55%
Class Discussion	26%	26%		17%	18%	9%	14%		23%	16%	25%	14%	18%
Activity Sequencing	10%	4%		13%	18%	11%	14%		8%	9%	8%	11%	10%
Conceptual Orientation	13%	6%		7%	0%	4%	9%		0%	5%	0%	4%	5%
Lecture & Demonstration	10%	14%		7%	9%	9%	5%		10%	8%	0%	0%	8%
Other	0%	2%		7%	0%	2%	5%		2%	4%	0%	7%	4%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

TIME SPENT ON CCNA COURSES

We asked instructors about how much time they spend on their CCNA courses relative to other courses they teach at their institutions. Instructors responded to this question on a 5-point scale. The numbers produced by combining the first two items on the scale represent the percentage of instructors who spend more time on a specific activity in the table, whereas the percentages produced by combining the last two points in the scale represent the percentage of instructors who spend less time on a specific activity. Instructors' responses from all the regions are presented in the table below (Table 10).

The table highlights the differences among the regions. There are no consistent patterns to the responses, with one exception: instructors from all but one region indicated that they spend less time grading in their CCNA courses compared to other courses they teach. Only the instructors from the Asia Pacific - Mature region indicated that they spend more time grading for CCNA courses. Instructors from the Asia Pacific - Mature region also spend far more time preparing for their CCNA classes relative to their other classes than instructors from any other region in the world.

TABLE 10. Time Spent Relative to Other Classes

		Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Before the term	Less	42%	49%	INSUFFICIENT DATA *	44%	27%	25%	50%	INSUFFICIENT DATA *	42%	37%	16%	18%	28%
	More	42%	22%		26%	64%	43%	18%		28%	27%	36%	50%	40%
Preparing classes	Less	32%	43%		43%	18%	21%	41%		30%	32%	24%	18%	26%
	More	42%	25%		23%	64%	38%	23%		37%	33%	36%	51%	41%
Preparing labs	Less	20%	49%		44%	0%	26%	55%		30%	31%	20%	17%	25%
	More	57%	26%		38%	82%	47%	32%		47%	47%	40%	60%	52%
Grading	Less	61%	45%		51%	27%	62%	67%		51%	52%	64%	48%	51%
	More	16%	23%		23%	46%	13%	10%		16%	17%	12%	15%	16%
Providing feedback	Less	55%	40%		46%	27%	36%	38%		33%	40%	32%	19%	29%
	More	26%	19%		25%	27%	25%	10%		28%	19%	8%	25%	23%
Mentoring students	Less	37%	42%		37%	18%	13%	43%		27%	30%	8%	9%	20%
	More	30%	22%		35%	36%	26%	19%		26%	20%	29%	34%	30%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

One possible explanation for the variability of responses across regions may be because we asked instructors to compare the time they spent on CCNA courses to the time they spent on other classes. The educational systems of the countries within each region have

developed over time according to the unique cultural features of each country and based upon expectations regarding goals and measures of success for schools. Because instructors were referencing different educational systems, it is difficult to draw general conclusions about these data. We believe this data may best be used by regional managers as they consider the commonalities and differences between the CCNA program and the school systems in each particular region.

However, we do expect that mentoring students is something that should be promoted and encouraged, regardless of differences in regional educational systems. Furthermore, the centralized curriculum and testing was expected to leave instructors with more time for mentoring students. However, in only three regions did the proportion of instructors report spending more time on mentoring in their CCNA class exceed the proportion reporting they spent less time: Asia Pacific mature, Australia and New Zealand, and the United States and Canada. These findings suggest that instructor training in managing the instructional process and perhaps in instructional practices may be necessary in many of the regions if the CCNA program is intended to foster a closer mentoring relationship between instructor and student.

SHOULD THE CCNA APPROACH BE APPLIED IN OTHER COURSES?

Five components of the CCNA program make it markedly different from traditional teacher-designed courses in high schools and post-secondary institutions. The online curriculum, online testing system, hands-on activities, professional development system and the technical-administrative support systems combine together to create a distinct “CCNA approach” to instruction. We measured the extent to which instructors think that these five components and the overall CCNA approach should be used in other courses such as mathematics and science. Instructors responded to this item on a 5-point Likert scale. The “agree” and “strongly agree” responses are grouped together and interpreted to mean that the CCNA approach should be applied to other courses. Due to insufficient data, instructors from Asia Pacific - Less Developed, Asia Pacific – Mature, and Russian and CIS regions are excluded in this analysis. Table 11 presents the results for applying the CCNA approach for other courses in schools.

A majority of the instructors from all regions agree that the CCNA approach should be used for other courses such as science and mathematics at their institutions. It is important to note that we asked “should” the approach be used for other classes, and not whether it “could” be used. Over 90% of the instructors from Africa, Middle East, Latin America, and Asia Pacific - Emerging strongly support the CCNA approach as a teaching model for other courses. In comparison, instructors from relatively more developed regions of the world are not

Because instructors were comparing to different educational systems, it is difficult to draw general conclusions about time. Regional managers can make the best out of it.

Five components make CCNA different from traditional courses.

as enthusiastic about applying the CCNA approach to other courses. Again, this difference may be attributable to the differences of school, educational systems, and resources across the various regions of the world.

TABLE 11. Should the CCNA approach be used in traditional courses?

	Africa	Latin America and the Caribbean	Asia Pacific - Less Developed	Asia Pacific - Emerging	Asia Pacific - Mature	Australia and New Zealand	Middle East	Russia and CIS	Central and Eastern Europe	European Market	Canada	United States	Average
Percent of instructors who say the CCNA approach should be used in traditional courses	86%	91%	INSUFFICIENT DATA*	90%	INSUFFICIENT DATA*	68%	96%	INSUFFICIENT DATA*	79%	69%	68%	70%	74%

* Not included in the analysis because there were less than 10 instructors in this region responding to the survey item.

CONCLUSION AND IMPLICATIONS FOR PROGRAM REDESIGN

The CCNA program was initially developed for the United States audience and then migrated to other countries. The needs of students and instructors in the United States have long been an important focus during program redesign. An important question is whether the students and instructors now involved in the program have similar needs and interests when compared with the many regions the program now serves. The data in this report show that there are striking commonalities across the 12 regions as well as striking differences.

Regional Similarities and Differences

CCNA instructors in most regions have a considerable amount of teaching experience, with most instructors reporting greater than 4 years experience as a teaching professional. The only exceptions are the two developing regions of Africa and Central and Eastern Europe, where more than 40% of instructors have less than 3 years teaching experience.

The professional networking experience of CCNA instructors is much more varied across regions than teaching experience, with the regions of the United States, Canada, Australia, and New Zealand having a greater number of instructors who have no professional networking experience than any other regions.

Our results indicate that in all regions, instructors are highly satisfied with the CCNA program from an overall perspective. The only region that presents an overall satisfaction rating of less than 80% is Asia Pacific - Mature, and as we indicated at the beginning of this report, a low response rate for that region means that all data from the region must be viewed cautiously. In fact, when we look at the data from the Asia Pacific - Mature region across all tables, we find a clear and consistent pattern of low ratings compared to other regions. This same pattern is also found in the international student data (see WP06-02). Also of note, the overall satisfaction level of American instructors is 83%, which is significantly lower than any other region except Asia Pacific - Mature. Nonetheless, 83% is still a high of satisfaction rating

Instructors from all regions gave relatively similar ratings for the value of the professional development components of program support. The greatest variation between regions in the area of professional development were in instructors' ratings of initial teacher training (with a 57% differential between Canada's rating of 30% and several other regions with ratings of 85% or above), and instructors' ratings of continuing teacher training (with a 46% differential between American and Canadian ratings of 40% and the Asia Pacific – Emerging region's rating of 86%). Implications from this study for teaching training are discussed in greater detail in the final section of this report.

Curriculum and materials also received relatively similar and high ratings from instructors in all regions. The only exception in this category was instructors' ratings for hardcopy textbooks, which varied in range between 43 and 77% across regions.

The technical and administrative support category was the most variable of the three categories that addressed issues of CCNA program support. The variation seen in these ratings from instructors in different regions makes sense because the implementation of technical and administrative support occurs at a regional level, rather than through the centralized source that is used for distribution of CCNA curriculum and materials.

The centralized curriculum and materials used in the CCNA program may help to explain why instructors from all regions engage in strikingly similar teaching activities during a typical classroom period. Instructors from all regions also gave similar responses to the question of what the most important teaching practices are for student learning. Data from these sections of the report lead to particular implications for redesign of the CCNA program, and these are discussed in the section below.

The CCNA International Instructor Survey included two questions that asked instructors to compare their experiences in CCNA courses with other courses they teach in their traditional school systems. One question asked specifically about how much time instructors spend on CCNA courses relative to other courses, and the second question asked instructors whether the CCNA approach should be used in

Instructors from all regions are highly satisfied with the CCNA program.

traditional courses. Instructors' responses to both of these questions showed a good deal of variation between regions. This variation is likely due not to differences in instructors' CCNA experiences across regions, but rather is a result of instructors' experiences in very different school systems that have developed over time in each region based on differing cultural expectations and different expectations about schooling

Teaching Practices

Given that this data represents the practices and perceptions of instructors from across the globe, the consistency of instructional practices that are used in a typical class period is striking. We expected to see a much greater degree of variability in the typical instructional practices used across regions, but the data show that the two most common instructional strategies are lecture (74%) and hands-on lab activities (74%). Testing and demonstration were the third and fourth highest ranked activities at 55% and 53% percent respectively.

In day-to-day practice, this means that instructors spend a great deal of time lecturing, perhaps using PowerPoint slides or using the materials provided by the program, and that there are frequently tests. There may be link between the typical instructional practices and the instructional materials provided by the program (e.g., lecture slides, lab guides, tests and demonstrations). Instructors use PowerPoint slides and lab guides that are designed and developed by the program, which are provided as part of the online curriculum. Instructors include demonstrations based on notes within the instructor guides that highlight important points where additional focus is required. Online tests are a part of the curriculum. Thus, there is strong congruity between the instructional design of the CCNA program and the teaching practices of the instructors who implement the program.

One important issue to consider is whether the typical instructional practices encouraged by the materials provided by the program are also the *best* instructional practices to support students' success. There does appear to be some overlap between typical instructional practices and instructors' perceptions regarding best teaching practices. A high percentage of instructors typically use hands-on labs and a high percentage of instructors identify hands-on labs as the most important teaching activity. A major disparity exists, however, in the percentage of instructors who typically use lecture (74%) and the percentage of instructors who identify lecture as the most important teaching activity (8%). This indicates that lecture is necessary but not sufficient as a teaching strategy used in the CCNA program.

An important implication from this data for program redesign is to consider what teaching practices are best and then design materials to support those practices. Given the link between instructional materials provided by the program and the teaching practices typically used by

There is a clear link between the materials provided by Cisco and instructor practices.

CCNA instructors, these findings indicate a powerful opportunity for improvement of course materials to better facilitate student learning and achievement in the program. It is clearly advisable for the program's instructional designers to consider changing the curriculum to provide materials to support a much greater variety of instructional methods, including more active teaching and learning strategies. This will make it easier for instructors to adopt those practices and thus they will be more likely to use them.

An opportunity exists for Cisco to improve lessons by reducing the amount of lecture and increasing the variety of other methods.

Instructor Training

Although instructors from all regions gave reasonable ratings for the value of initial teaching training (62%) and ongoing teaching training (59%), these ratings were significantly lower than instructors' ratings for the value of initial content training (84%) and ongoing content (73%). They are also lower than instructors' value ratings of other program elements. This suggests that the program is very good at providing guidance to instructors about *what* to teach (the content), but relatively weak at providing guidance to instructors about *how* to teach (instructional strategies).

A greater focus on initial and continuing pedagogical instructor training is needed.

An implication from this data for program redesign is that instructor training should go beyond simply providing content knowledge and include guidance about pedagogical knowledge and appropriate instructional practices to support student success. That is, it should help instructors learn how to teach the courses in the program. Even though each region and educational level may have unique needs, there is some similarity in the way instructors from all regions teach their CCNA classes. The fact that the program currently offers little centralized or systematic support for instructional practices may explain why instructors in the different regions vary greatly in the time they spend on CCNA courses relative to their other courses. By providing more advice and guidance to new instructors, the program may encourage the adoption of more effective teaching strategies and better focusing of instructor time.

Instructors rely on their own pedagogical knowledge, and spend time that matches their individual settings, which results in variations in time spent.

APPENDIX

Appendix 1: Countries by Regions

Africa			
Angola	Benin	Botswana	Burkina Faso
Burundi	Cameroon	Cape Verde	Central African Republic
Chad	Congo, Republic of The	Congo, The Democratic Republic of The	Cote D'ivoire
Djibouti	Eritrea	Ethiopia	Gambia
Ghana	Guinea-bissau	Guinea	Kenya
Lesotho	Liberia	Madagascar	Malawi
Mali	Mauritania	Mauritius	Mozambique
Namibia	Niger	Nigeria	Reunion
Rwanda	Sao Tome and Principe	Senegal	Seychelles
Sierra Leone	South Africa	St. Helena	Swaziland
Tanzania, United Republic of	Togo	Uganda	Zambia
Zimbabwe			
Latin America and the Caribbean			
Argentina	Bahamas	Barbados	Belize
Bolivia	Brazil	Chile	Colombia
Costa Rica	Dominican Republic	Ecuador	El Salvador
Guatemala	Haiti	Honduras	Jamaica
Mexico	Nicaragua	Panama	Paraguay
Peru	Puerto Rico	Trinidad and Tobago	Uruguay
Venezuela			

Asia Pacific - Less Developed			
Bangladesh	Bhutan	Cambodia	Fiji
French Polynesia	Lao People's Democratic Republic	Maldives	Mongolia
Nepal	Papua New Guinea	Samoa	Sri Lanka
Asia Pacific - Emerging			
China	India	Indonesia	Macau
Malaysia	Philippines	Thailand	Vietnam
Asia Pacific -Mature			
Hong Kong	Korea, Republic of	Singapore	Taiwan
Australia and New Zealand			
Australia	New Zealand		
Middle East			
Afghanistan	Algeria	Bahrain	Egypt
Iraq	Jordan	Kuwait	Lebanon
Morocco	Oman	Pakistan	Qatar
Saudi Arabia	Syrian Arab Republic	Tunisia	United Arab Emirates
West Bank/Gaza	Yemen		
Russia and CIS			
Armenia	Azerbaijan	Belarus	Georgia
Kazakhstan	Kyrgyzstan	Moldova, Republic of	Russian Federation
Ukraine	Uzbekistan		

Central and Eastern Europe			
Albania	Bosnia and Herzegovina	Bulgaria	Croatia
Czech Republic	Estonia	Hungary	Kosovo
Latvia	Lithuania	Macedonia	Poland
Romania	Serbia and Montenegro	Slovakia (Slovak Republic)	Slovenia
Turkey			
European Market			
Andorra	Austria	Belgium	Cyprus
Denmark	Finland	France	Germany
Greece	Iceland	Ireland	Israel
Italy	Luxembourg	Malta	Netherlands
Norway	Portugal	Spain	Sweden
Switzerland	United Kingdom		
Canada			
Canada			
United States			
American Samoa	Guam	United States	