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# Evaluation of the Bellevue College Consortium's HeW TAACCCT Grant

## Second Interim Report: Findings from First Round of Student Surveys

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# EXECUTIVE SUMMARY

The Health eWorkforce (HeW) Consortium, led by Bellevue College in Bellevue, Washington, is using a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Department of Labor to elevate health IT workforce development capacity on a local, state, and national level. At the nine colleges participating in the consortium, the TAACCCT grant is supporting the development of nine new health information technology (HIT) programs at six colleges and the infusion of content related to electronic healthcare information systems into 13 pre-existing nursing and allied health programs at eight colleges.

As part of its evaluation of this initiative, Social Policy Research Associates (SPR) surveyed students enrolled in the grant-funded programs to learn about their satisfaction with the curriculum and instruction related to health information technology and how well their training prepares them for their post-program employment and careers. This second interim report to the Consortium summarizes findings from the first of several rounds of surveys conducted with students enrolled in the grant-funded programs at the nine participating community colleges.

The following findings for the grant-funded nursing and allied health programs can be distilled from the surveys of the 138 current students and 97 program completers who responded or partially responded to the surveys:

- Students place a high value on the HIT content that has been infused into their programs under the grant and are very satisfied overall with the content and delivery of the HIT materials.

- Although only 77 percent of the 138 current-student respondents remembered learning about health information technology in their program, a large proportion of these students reported having had an opportunity for hands-on work with electronic health records.

- Respondents are generally satisfied with the way the health IT content is presented and the way it is integrated into the rest of the program. When asked how this aspect of the program might be improved, they suggested expanding the amount and scope of the HIT content, increasing opportunities for hands-on learning with electronic health records systems, allowing more opportunities for interactive discussion of HIT issues, and selecting instructors for HIT content who have more experience and expertise in this field.

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- The majority of current students who were planning to find new employment after program completion planned to look for jobs in the healthcare delivery field for which they trained. A majority of students planning to continue their education said that they wanted to continue learning about HIT topics as part of their ongoing education/training, and 15% said they were considering pursuing jobs specifically related to health information technology.

- A large majority of the 97 program completers reported being employed. Eighty-five percent of those employed said they were working in a field related to their training; of these, more than 85 percent said that their employer used electronic health records and that they themselves use electronic health records as part of their job duties.

- Close to 90 percent of the program completers who recalled receiving health IT content as part of their instruction said that they were either "very satisfied" or "somewhat satisfied" with the health IT information they received. Close to 60 percent of the program completers who were employed said that the health IT knowledge they had gained in their program had improved "to a great extent" or "moderately" their ability to perform well in their current jobs.

- The completer cohort made suggestions for improvement that were similar to those made by current students. They recommended increasing the emphasis on health IT in the program, adding more in-depth health IT content, using EHRs or simulated EHRs in clinical courses, improving the organization of HIT curriculum, and selecting instructors who were familiar with current use of EHRs in the workplace.

Responses from the 14 current participants and 12 completers who responded or partially responded to surveys were analyzed to create the following findings for the new HIT programs initiated under the TAACCCT grant:

- More than half of the current-student respondents had prior certificates or degrees in general IT or computer science before entering the grant-funded program. None of the respondents had prior education or training in a healthcare-related field.

- Among the respondents who received student support services (about a quarter of the total), most reported being satisfied with these services.

- Only roughly half of all respondents said that the program met their overall needs. A relatively high number of current participants indicated some dissatisfaction with the clarity of the instruction, felt the course content was too difficult, and didn't think the program content was taught in an "engaging" way. (The small number of current participants in the HIT programs and the low survey response rate among these participants, however, prevent us from giving too much weight to these findings. The current cohort of HIT program participants may have different impressions from students in previous program cohorts.)

- When asked about how the HIT program might be improved, current participants recommended upgrading the computer systems, making sure instructors are better

prepared, and providing more opportunity for classroom (as opposed to online) instruction.

- Although they had completed a grant-funded certificate, most HIT program completers who responded to the survey were still enrolled in school. Many appear to be working toward an AA degree in the same department at the same college. Thus, only two of the 12 program completers reported being employed in the HIT field. Only half of the respondents indicated that they currently were planning careers related to HIT.

- In contrast to the current HIT program respondents surveyed for this report, the HIT program completers tended to report satisfaction with the HIT program. Three-quarters of respondents said they were either "very satisfied" or "satisfied" with their program.

- The most frequent recommendation for program improvement was to expand hands-on learning in order to better prepare students for the realities of the workplace. Another suggestion was to promote post-program employment by developing connections between employers, recruiters, and program completers, and by dedicating more class time to resume preparation and teaching students about the workplace expectations specific to health IT jobs.

The responses to the first round of surveys of participating students and student completers in the nursing and allied health programs show that students believe that improved knowledge about healthcare information systems and practice using electronic medical record systems makes them better prepared to work in the healthcare field and improves their job performance. To date, students express high levels of satisfaction with the current level of infusion of HIT content into their programs but suggest that the programs expand that content and increase the amount of attention given to hands-on practice with EHRs throughout their programs.

The picture for the new HIT programs is less clear, perhaps because so few students have enrolled in these programs to date, and because different cohorts represent students enrolled in different HIT programs. To date, only a few HIT students have attempted to make the transition from school into jobs in the HIT sector, and only about half of the program completers indicate that they are planning to pursue employment in an HIT field.

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# I.  INTRODUCTION

The Health eWorkforce Consortium led by Bellevue College in Bellevue, Washington, is using a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Department of Labor to elevate health IT workforce development capacity on a local, state, and national level.  On a local level, the Consortium is building the capacity of nine participating community colleges to prepare students for careers involving health information technology (HIT).  At the state and national levels, multiple activities are underway, some of which involve contractual partnerships with external organizations. The Consortium is developing and piloting a national Health IT apprenticeship in the veterans community, developing a Veterans Health IT initiative with the Health Information Management Systems Society (HIMSS), creating and piloting cloud-based academic access to electronic health record systems to provide hands-on access for students, and promoting the use of state industry-education councils for the HIT sector to enhance industry-education links.

At the participating colleges, the TAACCCT grant is supporting the development of nine new health information technology (HIT) programs at six colleges and the infusion of instructional content related to electronic healthcare information systems into 13 pre-existing nursing and allied health programs at eight colleges (referred to in this report as "HIT infusion").  Social Policy Research Associates (SPR) is leading the effort to evaluate these grant-funded programs at the nine participating community colleges as well as assessing grant activities coordinated at the Consortium level.

To carry out an important component of the evaluation design, SPR contracted with the Social and Economic Sciences Research Center (SESRC) at the Washington State University in the fall of 2013 to design and conduct surveys of current participants and recent completers of the grant-funded programs offered at community colleges operating within the Health eWorkforce Consortium.  Because the grant objectives for the new HIT programs and those for the modified nursing and allied health programs were distinct, a decision was made to design separate survey instruments for the two types of programs.  As a result, four different surveys were developed: one for students enrolled in the new HIT programs; one for the students enrolled in the nursing and allied health programs that received grant support to develop and implement infused HIT content; one for completers of the new HIT programs; and one for completers of the health IT-

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infused nursing and allied health programs.  In general, the student surveys were designed to provide information about how satisfied students were with the curriculum and instruction related to health information technology, how well the HIT knowledge and skills they gained prepared them for their post-program employment and careers, and how the programs could be improved in terms of their HIT content and instruction.

Survey protocols were reviewed and approved by the Bellevue College Consortium team; survey questions and procedures were subsequently submitted to, and approved by, the Bellevue College's Institutional Review Board and by the relevant research and review organizations at each of the participating colleges.[1]

The first round of surveys was initiated in early June 2014 and completed by the end of July 2014.  Students who were active in the grant-funded programs during Winter Quarter 2014 were sent e-mail invitations to participate in a web-based survey.  Students who had completed programs on or before the end of Winter Quarter 2014 were contacted and invited to participate in a post-program telephone survey.[2]

The online survey of current students asked students to describe their previous educational and work experiences and their current career goals; it also asked them to indicate their level of satisfaction with HIT curriculum content, instructional quality of the HIT curriculum, and student supportive services.  The survey also invited students to suggest program improvements.  The telephone survey of program completers asked students to describe any jobs held since completing the program, to rate the relevance to their current jobs of the HIT knowledge and skills they had gained from the program, to outline plans for future employment and education, and to suggest ways to make the HIT content of the program more relevant to skills and knowledge needed on the job.

The number of potential respondents for the first round of each of the four surveys is shown in Exhibit 1.

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[1]   The IRB submission—BC-IRB-32—was approved by the Bellevue College IRB on April 10, 2014.

[2]   SPR identified the students appropriate for inclusion in each survey, using data from the Consortium's student database from which student identifiers had been removed.  Bellevue College subsequently provided the names and contact information for the individuals in this survey cohort to SESRC, the survey contractor.

**Exhibit 1:**
**Potential Respondents for First Round of Surveys**

| | "Infused" Nursing and Allied Health Programs | | New HIT Programs | |
|---|---|---|---|---|
| | Current Students | Completers | Current Students | Completers |
| Bellevue College | 187 | 87 | 0 | 1 |
| Bellingham Technical College | 100 | 124 | 15 | 0 |
| Clark College | 109 | 19 | 0 | 0 |
| Clover Park College | 16 | 15 | 0 | 0 |
| N. Virginia Community College | 13 | 0 | 4 | 1 |
| Pierce College | 3 | 1 | 0 | 11 |
| Renton Technical College | 66 | 36 | 0 | 0 |
| Spokane Community College | 39 | 0 | 32 | 6 |
| Whatcom Community College | 91 | 23 | 0 | 7 |
| Total | 624 | 305 | 51 | 26 |

The response rates are shown in Exhibit 2.

**Exhibit 2:**
**Responses for First Round of Surveys**

| | "Infused" Nursing and Allied Health Programs | | New HIT Programs | |
|---|---|---|---|---|
| | Current Students | Completers | Current Students | Completers |
| Potential Respondents | 624 | 305 | 51 | 26 |
| Actual Respondents | 138 | 97 | 14 | 12 |
| Response Rate | 22% | 33% | 28% | 48% |

Because of the relatively low response rates, we investigated the possibility that survey respondents were different from non-respondents on a number of key characteristics, thus possibly inducing non-response bias. As the analysis presented in Appendix A indicates, we estimate the level of non-response bias for the Nursing and Allied Health groups to be low. In the case of the HIT program, the very small number in the respondent groups (both current participants and completers), reduced the reliability of the non-response bias adjustments. For the reasons stated above, we opted to report the unweighted survey responses in this report for all groups.

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In the remainder of this report, we discuss the survey responses, first for the nursing and allied health programs, for which we have larger numbers of responses (because the number of students enrolled in these programs was much larger), and then for the new HIT programs. In Appendix B to this report, we provide a complete listing of responses for all survey questions, together with descriptions of the methodology and research instruments that were used for the survey.

Future interim reports and the evaluation's final report will present findings from a second round of student surveys, as well as describe grant accomplishments at the college level and assessing progress in meeting consortium-level initiatives.

# II.  NURSING AND ALLIED HEALTH PROGRAMS

Although the response rates were relatively low for both the survey of current students in the grant-funded nursing and allied health programs and the survey of program completers, there were enough total responses to provide useful information about how students experienced the infused HIT content and what it meant to them after they had completed their programs.

## Findings from Current Participants in the Nursing and Allied Health Programs

Of the 624 nursing and allied health program participants invited to participate in the survey of current participants, 138 individuals completed or partially completed the survey, for a 22 percent response rate.  In surveying these students, whose nursing and allied health programs had been infused with HIT content under the TAACCCT grant, several issues were of particular interest to the evaluation team:
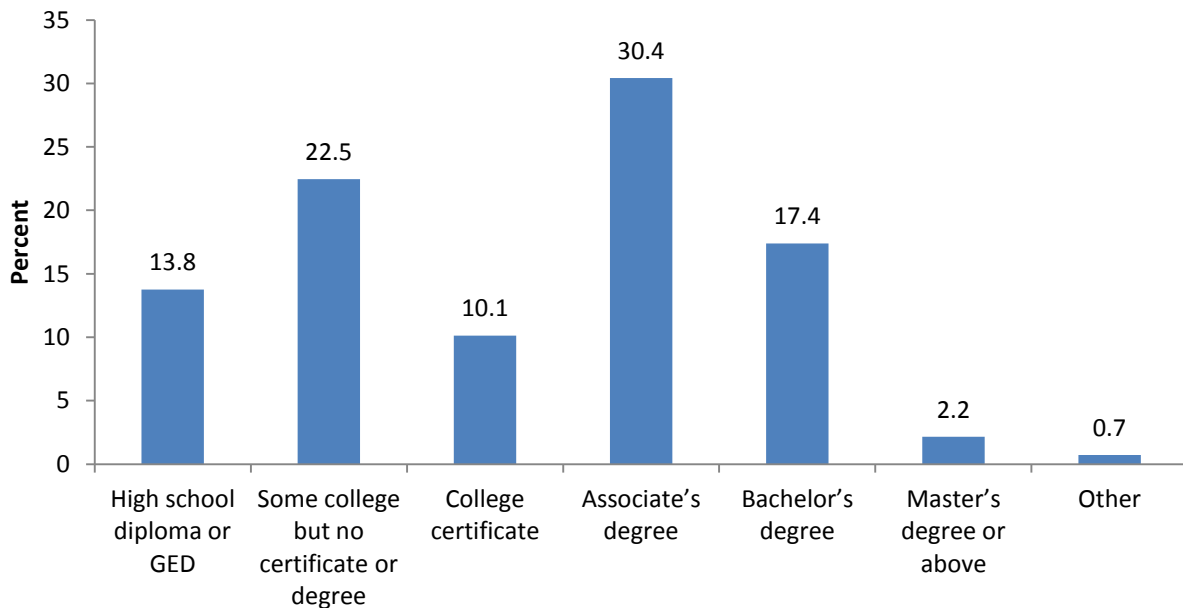
- whether students remembered taking a course that covered healthcare information systems or electronic health records;

- how satisfied students were with the overall delivery of HIT content, instructors' knowledge of the HIT content, and the quality of the student support services that they used;

- whether students felt they had been given enough opportunities for hands-on practice using electronic health records; and

- how many students were interested in obtaining more training related to health information technology and whether they were considering seeking jobs in a HIT field.

### Prior Education and Future Career Plans

The educational backgrounds of the students enrolled in the nursing and allied health programs were varied.  Over half of the respondents had previously completed an associate's degree or higher post-secondary degree prior to enrolling in their program.  Of these, 20 percent had previously completed a bachelor's or higher-level degree.  At the other end of the spectrum, 14 percent of the respondents did not have any education beyond a high school diploma or a GED.  This wide variation is consistent with the varying prerequisites for the nursing and allied health

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programs included in the study, which ranged from training in medical office assisting and medical assisting to programs in nursing, physical therapy, and radiologic technology.

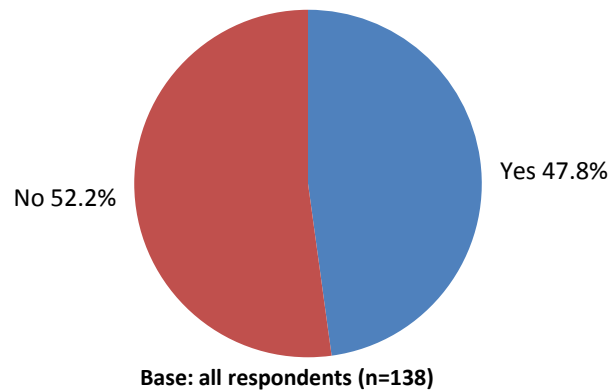**Exhibit 3:**
**Previous Educational Background**



*Survey of Current Nursing and Allied Health Students (Round 1)*

As shown in Exhibit 4 below, nearly half of survey respondents were employed at the time of the survey.

**Exhibit 4:**
**Currently Employed**



No 52.2%    Yes 47.8%

**Base: all respondents (n=138)**

*Survey of Current Nursing and Allied Health Students (Round 1)*

When asked about their immediate goals after completing the program, 53 percent of the respondents to the survey of current nursing and allied health program students indicated they were planning to pursue further education, 76 percent said they wanted to pursue employment, and 12 percent planned to stay in their current jobs (Exhibit 5).[3]

**Exhibit 5:**
**Post-Program Goals**

|  | Percentage of total respondents |
|---|---|
| Further education | 52.9 |
| Employment | 76.1 |
| Stay in current job | 11.6 |

**Base: all respondents (n=138)**

*Survey of Current Nursing and Allied Health Students (Round 1)*

Among those who intended to pursue further education, a very large proportion (94 percent) indicated that their planned training will be in the healthcare field (see Exhibit 6).  One quarter of those who intended to pursue further education said they planned to pursue additional training in HIT.

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[3]  The answers add up to more than 100 percent because students could choose more than one response option.

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**Exhibit 6:**
**Detailed Education Plans of those Planning to Pursue Further Education**

| | Health information technology | General computer science or IT | Healthcare |
|---|---|---|---|
| N | 18 | 3 | 69 |
| % | 24.7 | 4.1 | 94.5 |

*Survey of Current Nursing and Allied Health Students (Round 1)*

An overwhelming majority of those who were planning to find new employment after program completion indicated they would search for new employment in the healthcare field for which they trained; 20 percent said they would look for a job in another healthcare field; and 15 percent said that they would be looking for jobs related to healthcare information technology (see Exhibit 7).

**Exhibit 7:**
**Detailed Employment Plans of those Planning to Pursue Employment**

| | Same healthcare field as trained | Different healthcare field | Health IT |
|---|---|---|---|
| N | 99 | 21 | 16 |
| % | 94.3 | 20.0 | 15.2 |

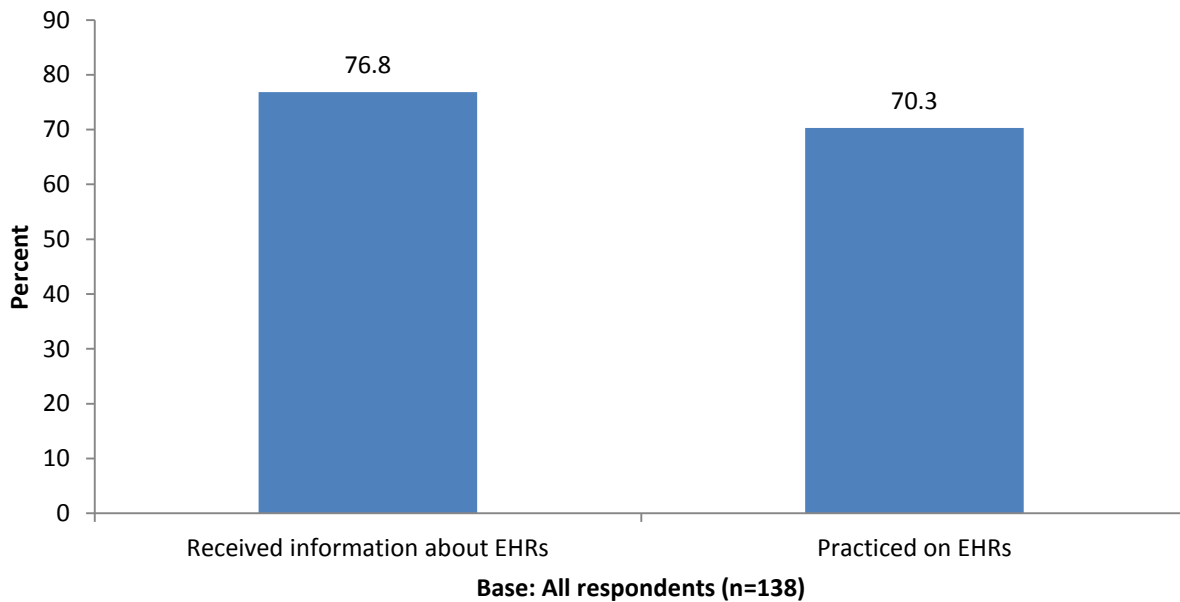*Survey of Current Nursing and Allied Health Students (Round 1)*

## Satisfaction with the Design and Delivery of HIT Content and Suggestions for Program Improvement

Only three-quarters of the respondents to the survey of current nursing and allied health students reported that they had received information about health information systems or electronic health records as part of their programs. A possible reason for this figure not approaching 100% is that some of the respondents had not yet taken the HIT-infused courses that were part of their planned program of study.[4] This proportion did not appear to vary notably by age group or type of program. A high percentage of respondents who remembered receiving information about

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[4]  Although we planned to have colleges identify students that had not yet taken at least one infused course, so they could be excluded from the survey, this information was not available from the Consortium for the first round of surveys. Therefore, some of the respondents may not yet have enrolled in a course that had been infused with HIT content. Others may later take another course with information about health information systems.

healthcare information systems reported that their program had provided them with opportunities for hands-on practice using electronic health records (see Exhibit 8).

**Exhibit 8:**
**Experience with Electronic Health Records During Program**



*Survey of Current Nursing and Allied Health Students (Round 1)*

Survey respondents were asked to indicate their level of satisfaction with several features of the delivery of health IT content in their programs. As shown in Exhibit 9, students tended to agree with the following statements:

- *The instructors are knowledgeable about the health IT topics they cover* (53 percent of respondents who expressed an opinion agreed or strongly agreed);

- *The health IT content is at the right level* (52 percent); and

- *The health IT content meshes well with the other health program content* (50 percent).

However, respondents were less likely to agree or strongly agree with the statement:

- *The program includes enough hands-on learning with electronic health records*. (Note: The request for additional opportunities for hands-on practice with EHRs is a theme that appears multiple times in the survey responses, among both nursing/allied health students and HIT students.)

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**Exhibit 9:**
**Satisfaction with Program Features**



| | Strongly Disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|
| The instructors are knowledgeable about health IT topics (n=107) | 2.8 | 13.1 | 30.8 | 33.6 | 19.6 |
| The health IT content meshes well with other program content (n=108) | 1.9 | 13.1 | 32.7 | 40.2 | 12.1 |
| The health IT concepts are explained clearly (n=107) | 3.7 | 16.7 | 29.6 | 37.0 | 13.0 |
| The Health IT content is not too difficult or too easy (n=107) | 2.8 | 22.4 | 26.2 | 36.4 | 12.1 |
| Overall, the health IT instruction meets needs (n=109) | 7.8 | 20.4 | 30.1 | 33.0 | 8.7 |
| Program includes enough hands-on learning with EHRs (n=109) | 5.5 | 19.3 | 34.9 | 30.3 | 10.1 |
| Health IT content is engaging (n=103) | 17.4 | 25.7 | 22.0 | 25.7 | 9.2 |

■ Strongly Disagree  ■ Disagree  ☐ Neutral  ☐ Agree  ■ Strongly agree

*Survey of Current Nursing and Allied Health Students (Round 1)*

When asked to provide suggestions for improving the content and delivery of health information technology topics in their programs, nursing and allied health program participants most frequently responded that they wanted the program to provide more hands-on practice with EHR systems. Other suggestions were to provide more content on health information systems in general, and to select instructors for the HIT content modules who are subject matter experts in HIT, or who are at least are familiar with EHRs.

## Findings from Program Completers

Of the 305 students who had completed their nursing and allied health program programs by the end of the Winter Quarter of 2014, 97 either fully or partially completed the phone survey, for a 33 percent response rate. This number of responses was sufficient to describe how program completers assessed the value of what they had learned about health information systems and EHRs.
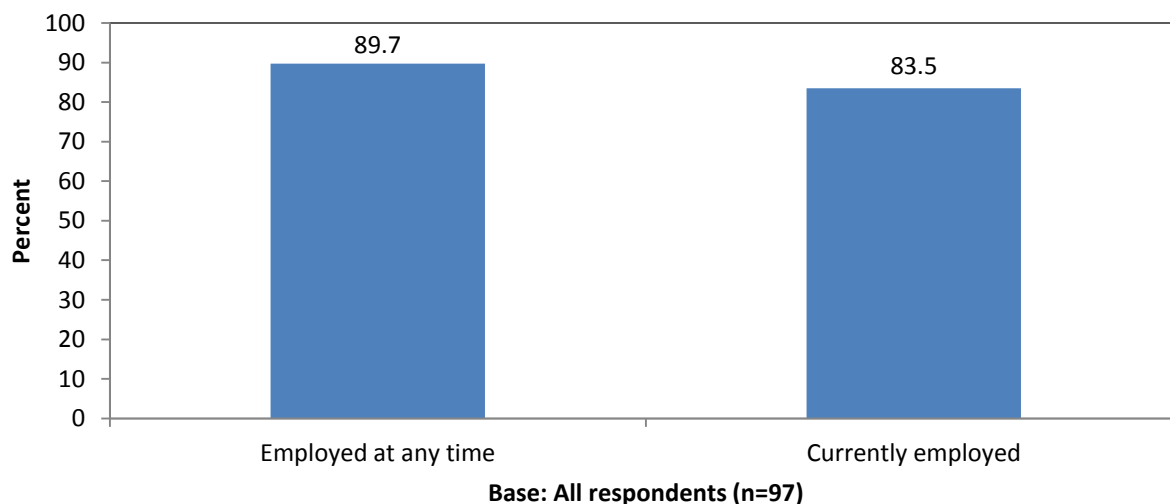
In surveying the nursing and allied health program completers, the evaluation team was concerned with the following issues:

- whether program completers were working in a workplace that made use of electronic health records and whether the respondent used EHRs as part of his/her job responsibilities;

- whether program completers were planning to pursue additional training that would increase their knowledge or skills in health information technology;

- whether respondents pictured themselves working in a HIT or IT field in five years;

- how satisfied respondents were with what they had learned about health information systems and electronic health records in their nursing or allied health program and how well it prepared them to work in a job in a healthcare setting that uses EHRs; and

- what recommendations program completers would make for improving the delivery of HIT content in their programs.

## Post-Program Employment Experiences

Nearly 90 percent of the program completers who participated in the telephone survey said that they had been employed at some time since completing their program, and 84 percent said they were employed at the time of the survey (see Exhibit 10).

**Exhibit 10:**
**Employment Since Program Completion**
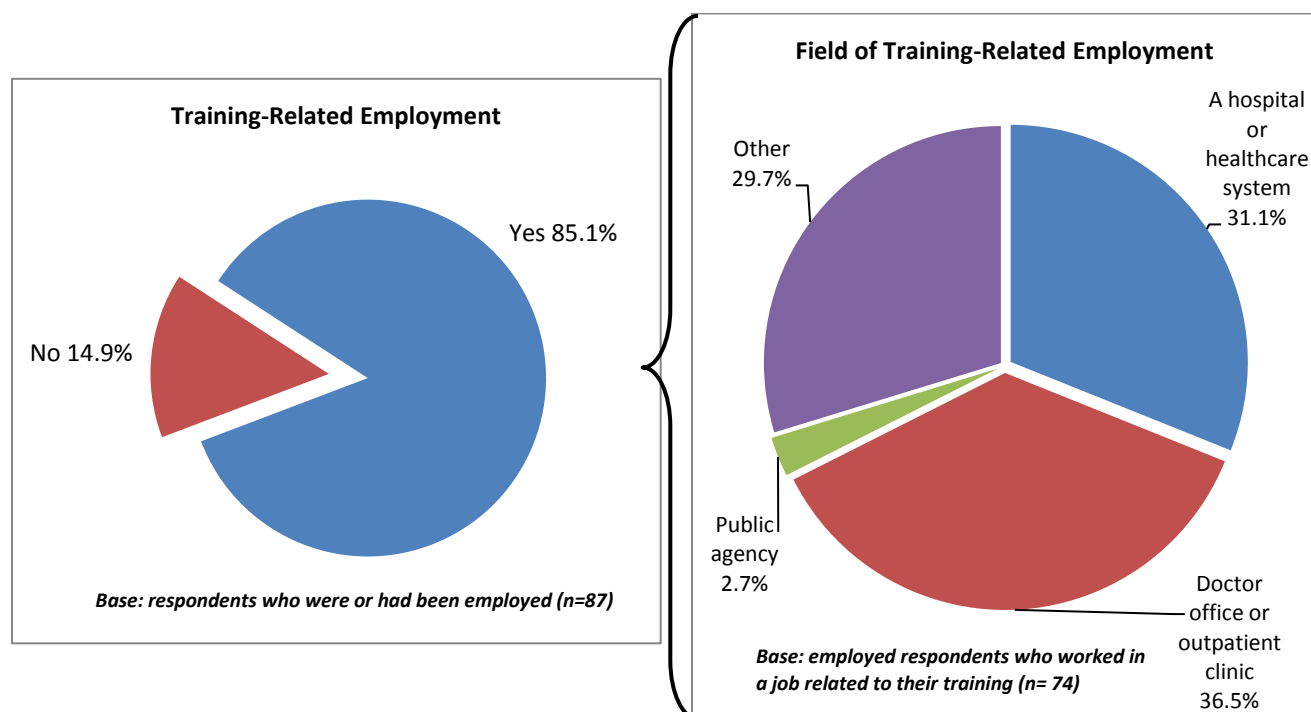


Base: All respondents (n=97)

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

More than 85 percent of the nursing and allied health program completers who were employed said they were working in a job related to their program (see Exhibit 11). Nearly a third of the

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respondents who were working in a field related to their training said that they worked in a hospital or for a healthcare system, and slightly over a third said they worked in a doctor's office or outpatient clinic[5].

**Exhibit 11:**
**Detailed Employment**

**Training-Related Employment**

Yes 85.1%

No 14.9%

*Base: respondents who were or had been employed (n=87)*

**Field of Training-Related Employment**

Other 29.7%

A hospital or healthcare system 31.1%

Public agency 2.7%

Doctor office or outpatient clinic 36.5%

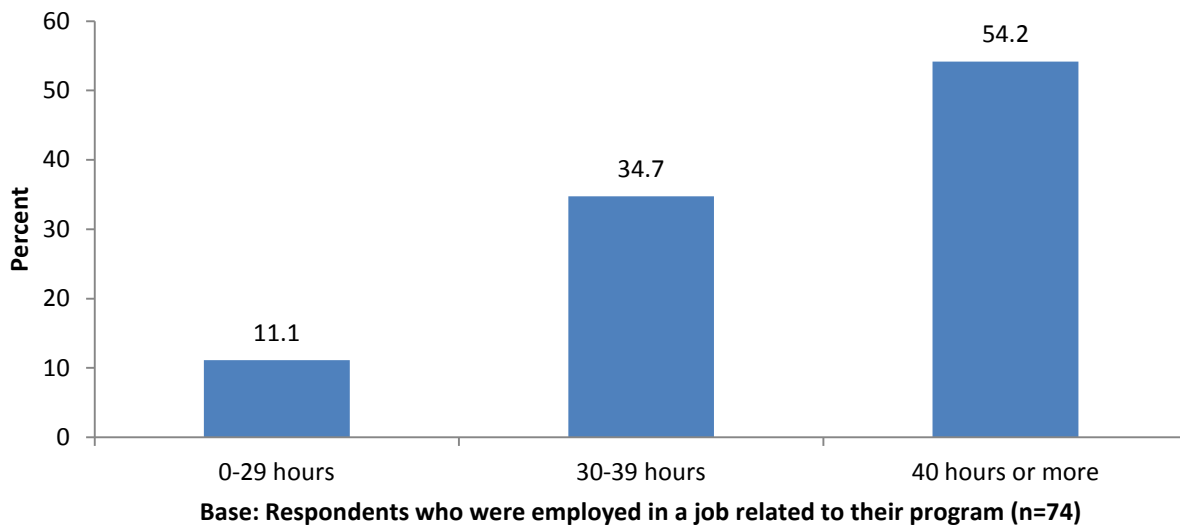*Base: employed respondents who worked in a job related to their training (n= 74)*

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Almost 90 percent of the respondents who said they were working in a job related to their training reported that they worked 30 or more hours per week (see Exhibit 12). The high incidence of full-time work suggests that most of the nursing and allied health program completers had been able to find stable jobs in their fields.

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[5] However, survey respondents who had completed their program 12 months or longer before the time they were surveyed more frequently worked in a hospital setting than respondents who had finished their program more recently. This might indicate that initial program cohorts were different from newer ones, or that in the long term, after experimenting with several jobs, program completers tended to gravitate toward hospital-based jobs.
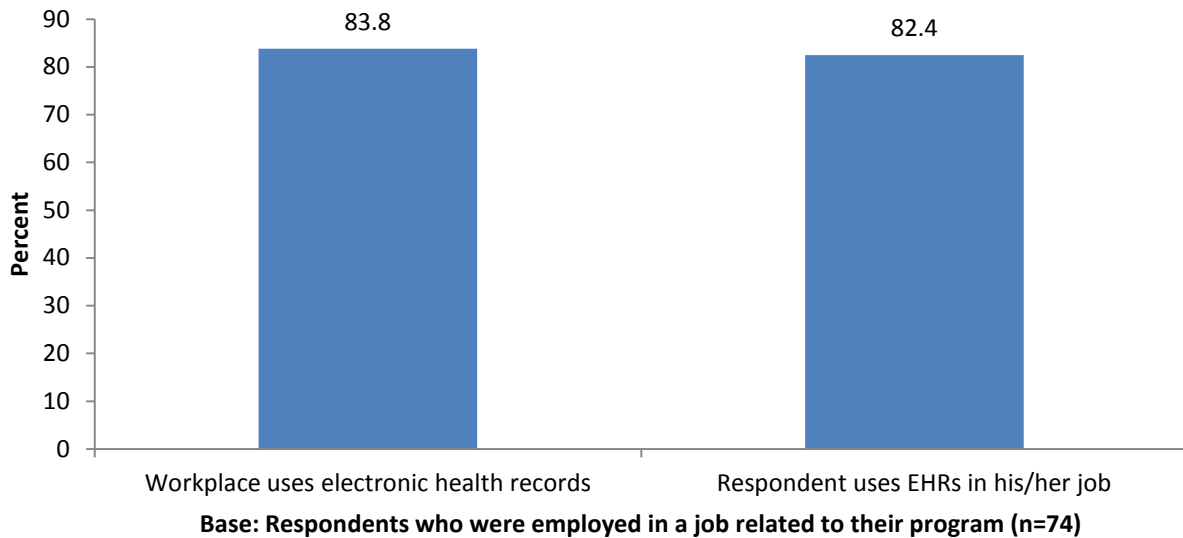
**Exhibit 12:**
**Hours Worked per Week**



Base: Respondents who were employed in a job related to their program (n=74)

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

A great majority of program completers reported that they were working in a setting that uses electronic health records. Eighty-four percent of the respondents who were employed in a job related to their program said that their workplace uses electronic health records, and 83 percent said that that they themselves use electronic health records as part of their job duties (see Exhibit 13). Thus, the Consortium's goal of infusing HIT content into nursing and allied health program curricula appears to address a job skill that is required in the workplace of most program completers.

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**Exhibit 13:**
**Use of Electronic Health Records in the Workplace**



**Base: Respondents who were employed in a job related to their program (n=74)**

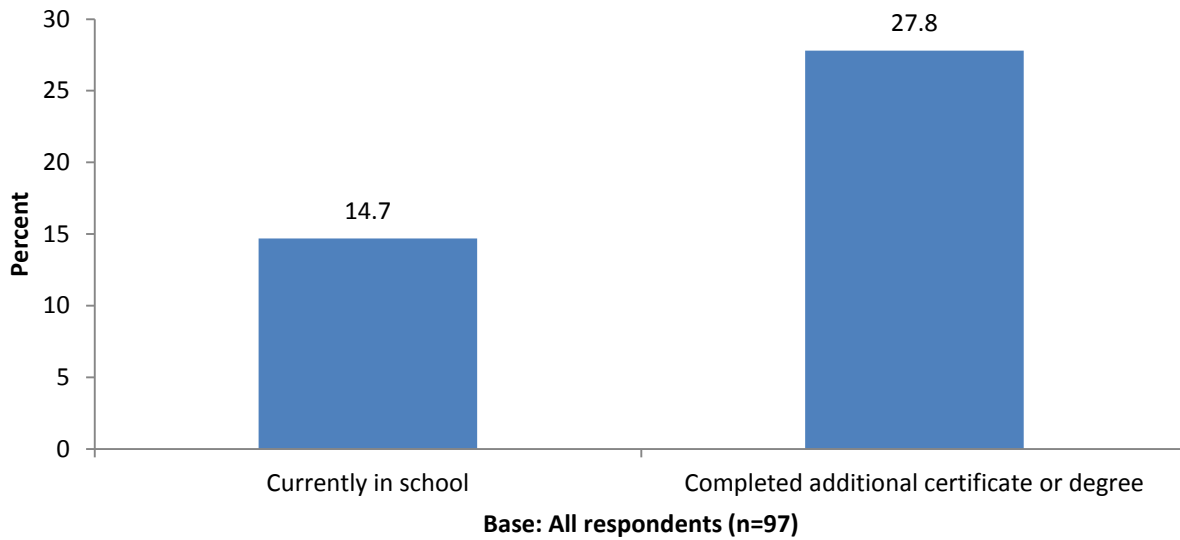*Survey of Completers of Nursing and Allied Health Students (Round 1)*

## Post-Program Schooling Experiences and Plans

Fewer than 15 percent of the respondents said that they were in school at the time of the survey (see Exhibit 14). However, about a quarter of the respondents indicated that they had completed an additional healthcare-related certificate or degree since the completion of their TAACCCT-funded program.

**Exhibit 14:**
**Post-Program Schooling**



Base: All respondents (n=97)

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Not surprisingly, completion of additional healthcare training seemed directly proportional to the length of time elapsed since completion. Whereas only 17 percent of those who had completed their programs less than six months prior to the survey said that they had completed additional healthcare training, this proportion was 53 percent among the respondents who had completed their programs a year or more before the survey (see Exhibit 15).

**Exhibit 15:**
**Percent of Respondents That Had Attained Post-Program Healthcare Certificate or Degree**

| Time since program completion | Yes | No |
|---|---|---|
| Less than 6 months | 2 | 10 |
| | 16.7% | 83.3% |
| 6-12 months | 16 | 48 |
| | 25.0% | 75.0% |
| 12 months or more | 9 | 8 |
| | 52.9% | 47.1% |

Overall, 47 percent of the respondents declared that they were planning to enroll in additional education or training.  Of those who wanted to pursue additional schooling, more than a third (36

percent) said that the additional schooling would involve learning more about health information technology (see Exhibit 16).

**Exhibit 16:**
**Detailed Educational Plans**



Planning to Enroll in Further Education

Don't know 6.2%

No 47.4%

Yes 46.4%

*Base: All respondents (n=97)*

Plans for Further Health IT Training

Don't know 11.1%

Yes 35.6%

No 53.3%

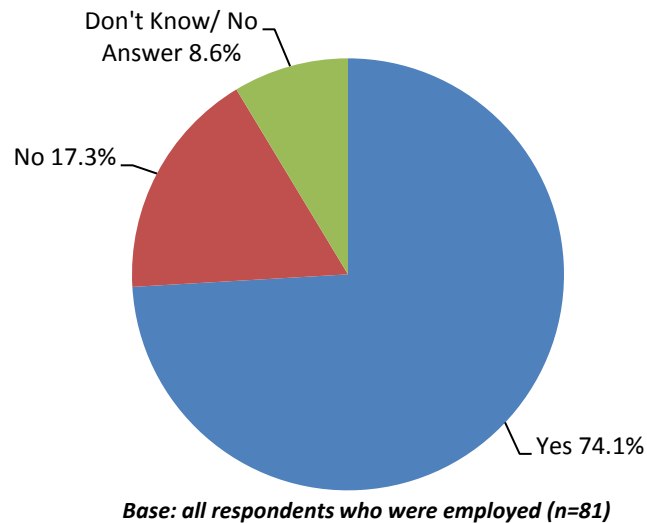*Base: respondents who plan to enroll in further education (n=45)*

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

## Satisfaction with the Program and Suggestions for Improvement

Close to three quarters of the survey respondents who were employed at the time of the survey recalled that they had received information regarding health information systems or electronic health records as part of their programs (see Exhibit 17). Neither age, nor the type of program completed (certificate vs. degree), nor length of time since program completion corresponded to important differences in this proportion. This speaks to a considerable degree of uniformity in infusing the Health IT content across participating programs and colleges.
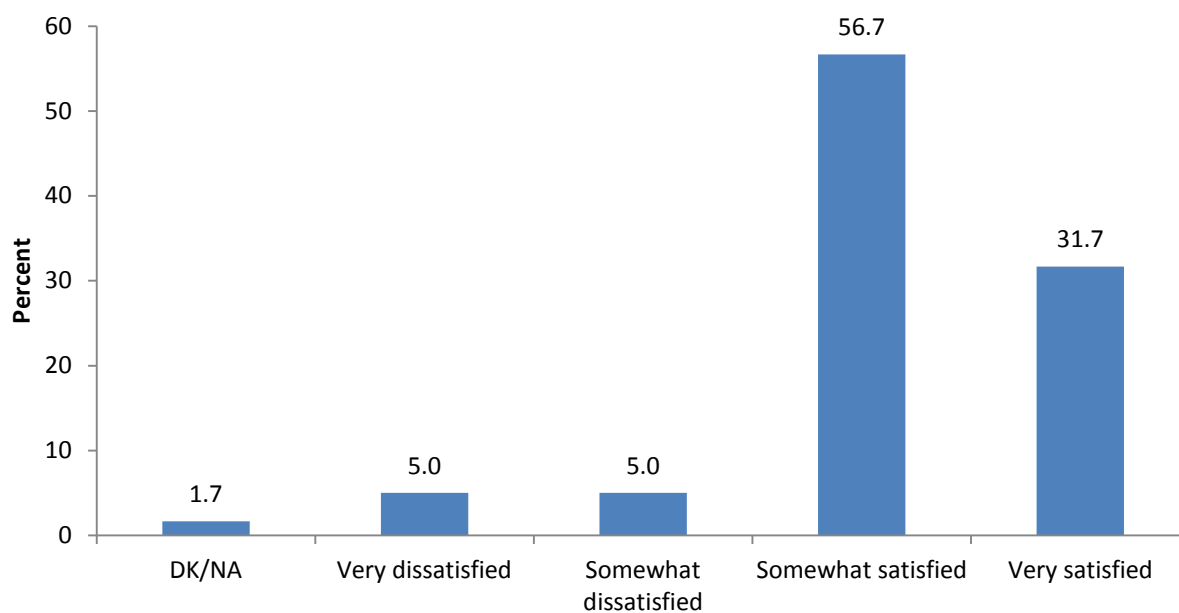
**Exhibit 17:**
**Received Information about Health Information Systems**
**or Electronic Health Records as Part of Program**



*Base: all respondents who were employed (n=81)*

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Of those who recalled receiving health IT content as part of their instruction, close to 90 percent said that they were either "very satisfied" or "somewhat satisfied" with the health IT information they had received (see Exhibit 18). This high level of satisfaction was consistent across students with different characteristics, such as age, gender, previous level of education, or work experience.

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**Exhibit 18:**
**Satisfaction with Information about Health Information Systems**



Base: employed respondents who recalled receiving health IT content (n=60)

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Moreover, as shown in Exhibit 19 below, close to 60 percent of the respondents who were employed said that the health IT knowledge that they had gained in their programs had improved "to a great extent" or "moderately" their ability to perform well in their current jobs.

**Exhibit 19:**
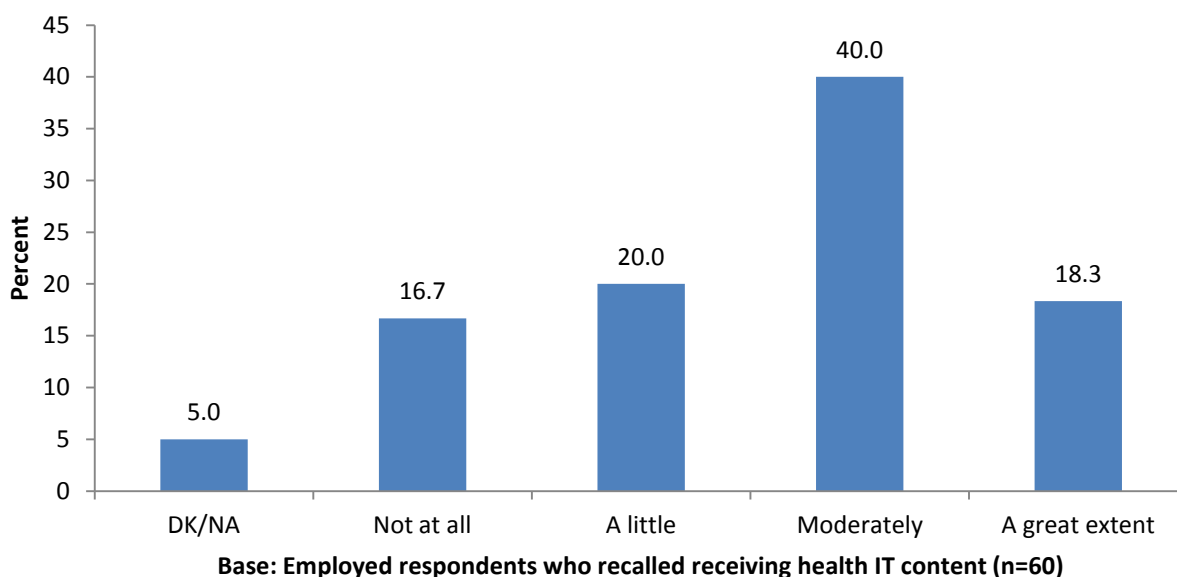**Degree to Which Health IT Knowledge from Program Improved Job Performance**



Base: Employed respondents who recalled receiving health IT content (n=60)

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Participants surveyed one year or more after program completion reported a much higher level of perceived usefulness—a combined 70 percent for "improved to a great extent" and "improved moderately"—than completers surveyed less than 6 months after graduation, whose combined satisfaction was under 20 percent (see Exhibit 20 below). This appears to indicate that the usefulness or perceived usefulness of health IT infusion may take time to be fully realized—perhaps as program completers are increasingly exposed to situations where knowledge of health IT is needed, or as they gain confidence in using these skills.

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**Exhibit 20:**
**Degree to Which Health IT Knowledge from Program Improved Job Performance, by Time Elapsed since Program Completion**
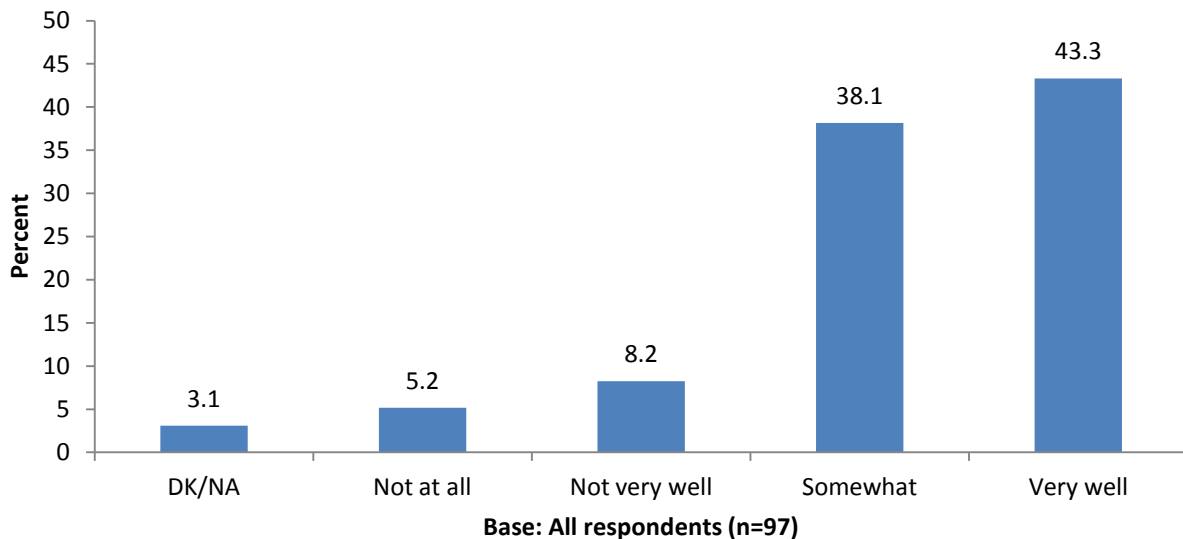
| Time since program completion | Health IT Knowledge Improved Job Performance | | | | |
|---|---|---|---|---|---|
| | **Don't know** | **Not at all** | **A little** | **Moderately** | **A great extent** |
| Less than 6 months | 2 | 1 | 3 | 1 | 0 |
| | 28.6% | 14.3% | 42.9% | 14.3% | 0% |
| 6-12 months | 0 | 8 | 8 | 21 | 6 |
| | 0% | 18.6% | 18.6% | 48.8% | 14.0% |
| 12 months or more | 1 | 1 | 1 | 2 | 5 |
| | 10% | 10% | 10% | 20% | 50% |

*Survey of Completers of Nursing and Allied Health Students (Round 1)*

Most of the completers who said that the health IT content helped them to a great extent in their job said that they "used what they had learned" in their jobs and that they "became prepared" for the job. One respondent also said that paid or unpaid internships required during the final quarters of his/her program had been essential. Program completers who found the health IT content to be of "moderate" help said that the program gave them the basic knowledge needed for the job, but that they had learned much of what they knew on the job, since the software used in their job was different from the software they had been exposed to during the program. Program completers who indicated that they had found health IT knowledge to be of little or no help indicated that they were not employed in a job that required them to use HIT skills, that the instruction was either unclear or rushed, or that the EHR software used in instruction was not similar to the one used on the job.

Together with the above questions, which were aimed specifically at those respondents who were employed, the survey asked all respondents a question about the usefulness of the program in preparing them for jobs that use health information technology. Similar to the findings reported above, a large majority of respondents had a positive opinion about the program, with more than 80 percent of respondents declaring that their program had prepared them "very well" or "somewhat well" for a job that uses electronic health records and health information technology (see Exhibit 21 below).

**Exhibit 21:**
**How Well Program Prepared Respondents to Work**
**in Setting that Uses Health Information Technology**



*Survey of Completers of Nursing and Allied Health Students (Round 1)*

The respondents who said the program prepared them very well said that they were satisfied with the preparation on electronic health records they had received as part of the program, and that courses with clinical sessions, practicums, or internships were useful. Respondents who said that the program prepared them somewhat well indicated that the program gave them "a taste" of what was needed, but that more learning was needed on the job. Respondents who were less satisfied with the instruction on health information technology complained that their program had not included sufficient information on EHRs and/or that the systems on which instruction had taken place were different from the systems used on the job.

When respondents were invited to offer suggestions for program improvement, they frequently recommended increasing the focus on and broadening the scope of health IT content in the program or adding additional health IT content. Other frequently mentioned suggestions were to increase opportunities to practice using EHRs in clinical settings or simulated clinical settings and to improve instructional quality and the organization of the curriculum.

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# III.  HEALTH INFORMATION TECHNOLOGY PROGRAMS

The nine new HIT certificate programs were developed to realize the grant's goal of creating programs specifically designed to prepare students for job opportunities in the rapidly expanding HIT field.  Individual programs targeted different levels of knowledge and different sub-topics within the larger field.  Most programs presumed that enrolling students would have substantial previous knowledge and experience in either healthcare or computer systems/information technology.  Because the new HIT programs were so diverse, it is difficult to draw generalizations from the responses of the small number of current students and program completers who responded to the surveys.  Nevertheless, the responses provide useful information about satisfaction with the programs and their perceived usefulness in obtaining employment.

## Findings from Current Participants

Fourteen of 51 current health IT program participants completed or partially completed the web survey, for a 28 percent response rate.  In surveying current students in the new HIT programs, issues of particular interest for the evaluation team included:
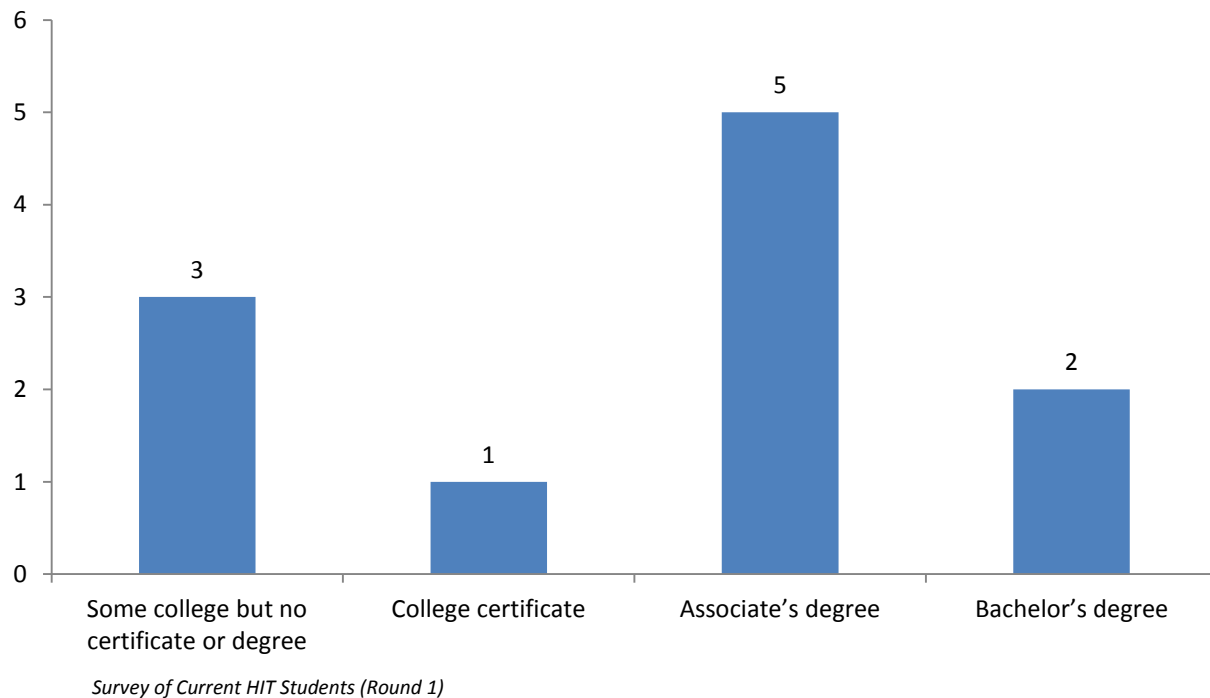
- whether students enrolled in the HIT programs had prior education and/or work backgrounds in healthcare or computer science/information technology fields;

- whether students had been able to obtain credit in their HIT program for previous areas of school-based or work-based learning;

- how satisfied students were with the overall content and delivery of program content, instructors' knowledge of their subjects, and the quality of the student support services that they used;

- students' career goals and plans for further education; and

- assessment of the strongest and weakest features of the program and suggestions for improving the program.

## Prior Education and Employment and Future Career Plans

All the current participants in HIT programs who responded to the survey had some other postsecondary educational experience (see Exhibit 22).  Almost half of the respondents had an

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associate's degree, a little over a quarter had attended some college but had no certificate or degree, and about a fifth had a bachelor's degree.

**Exhibit 22:**
**Previous Educational Background**



*Survey of Current HIT Students (Round 1)*

Although only one person in the sample was employed at the time of the survey (see Exhibit 23), more than half of the respondents had worked previously either in general computer science (five respondents) or health IT (one respondent).  Only one respondent had previous employment experience in a healthcare delivery field (see Exhibit 24).  In summary, the students who enrolled in the new HIT programs tended to have prior educational and work experience in general information technology, without having prior specialization in health IT.

**Exhibit 23:**
**Currently Employed**

Yes 1

No 10

*Survey of Current HIT Students (Round 1)*

**Exhibit 24:**
**Fields of Previous Employment**

[Bar chart showing values: Health IT = 1, General computer science or IT = 5, Healthcare = 1, Other = 2]

*Survey of Current HIT Students (Round 1)*

## Satisfaction with the Program and Suggestions for Improvement

Survey respondents were asked to indicate their level of satisfaction with a number of program characteristics. On the whole, the current students' satisfaction with the program was relatively
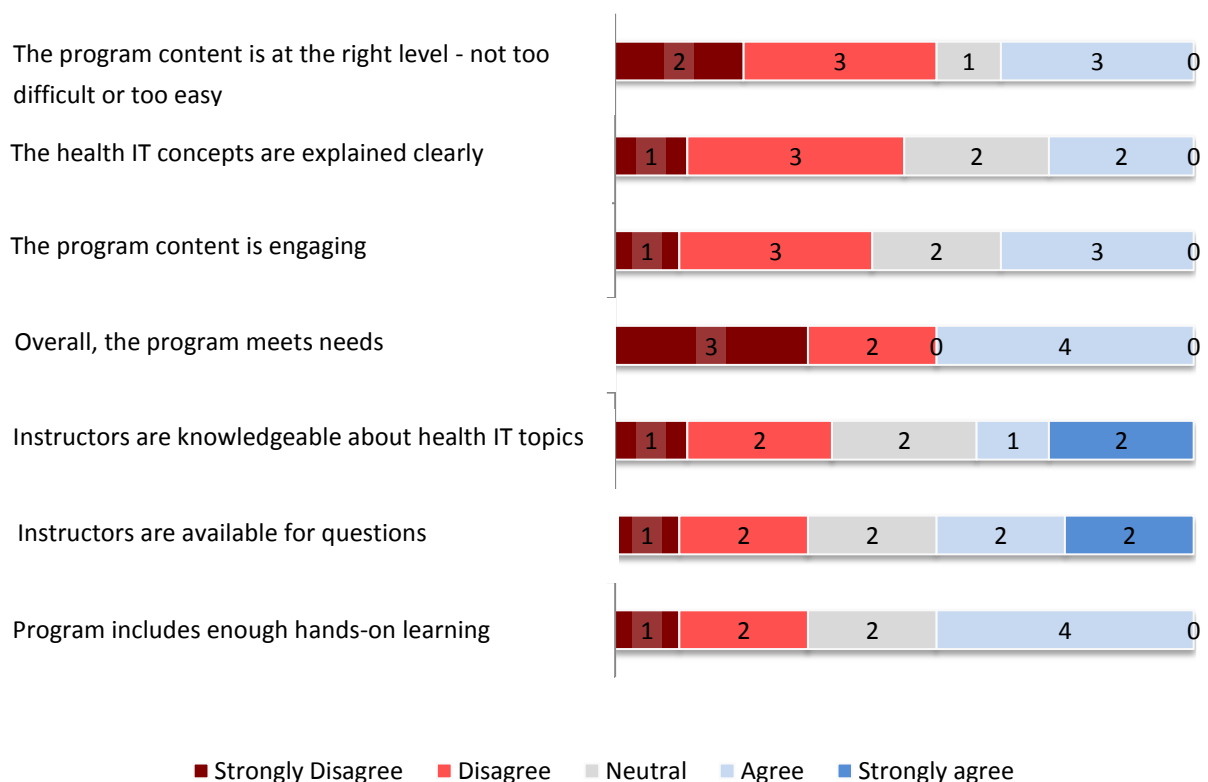
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low (in contrast, HIT program completers gave relatively high satisfaction ratings, as reported in the next section). A seen in Exhibit 25, the number of students who rated the program positively exceeded the number rating it negatively for only two characteristics: instructors' availability to answer questions and the availability and sufficiency of hands-on learning (but only marginally). For all the other characteristics, negative views predominated—including the overall assessment of whether the program responded to students' needs (one-third of respondents disagreed with this statement).

In addition, five respondents said that the coursework in their program was "somewhat difficult" or "very difficult," compared to only two who believed the coursework was "somewhat easy" or "very easy" (see Exhibit 26 below).

**Exhibit 25:**
**Satisfaction with Program Features**



The program content is at the right level - not too difficult or too easy: Strongly Disagree 2, Disagree 3, Neutral 1, Agree 3, Strongly agree 0

The health IT concepts are explained clearly: Strongly Disagree 1, Disagree 3, Neutral 2, Agree 2, Strongly agree 0

The program content is engaging: Strongly Disagree 1, Disagree 3, Neutral 2, Agree 3, Strongly agree 0

Overall, the program meets needs: Strongly Disagree 3, Disagree 2, Neutral 0, Agree 4, Strongly agree 0

Instructors are knowledgeable about health IT topics: Strongly Disagree 1, Disagree 2, Neutral 2, Agree 1, Strongly agree 2

Instructors are available for questions: Strongly Disagree 1, Disagree 2, Neutral 2, Agree 2, Strongly agree 2

Program includes enough hands-on learning: Strongly Disagree 1, Disagree 2, Neutral 2, Agree 4, Strongly agree 0

■ Strongly Disagree  ■ Disagree  ▪ Neutral  ▪ Agree  ■ Strongly agree

*Survey of Current HIT Students (Round 1)*

**Exhibit 26:**
**Level of Difficulty of Coursework**



Bar chart with categories: DK/NA = 2, Very difficult = 2, Somewhat difficult = 3, Neither easy nor difficult = 2, Somewhat easy = 1, Very easy = 1.
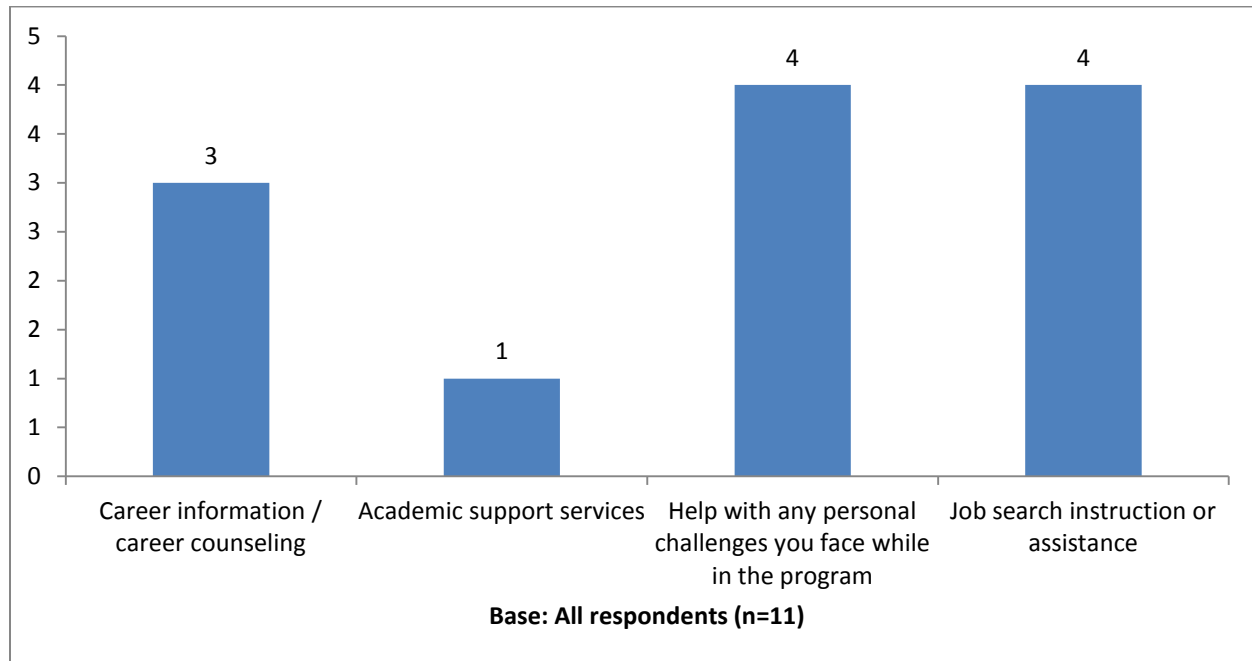
*Survey of Current HIT Students (Round 1)*

This overall "cool" appraisal of the HIT programs by current students is difficult to square with the high program satisfaction scores reported by program completers (reported in the next section). There are two ways in which these findings could be interpreted. First, HIT completers might be more satisfied with their program experience than current students because enough time has passed for its value to be understood and appreciated. Second, these low satisfaction scores could be artifacts of the small respondent group size. Either way, the small number of respondents recommends against drawing firm conclusions from these findings.

Another area of interest for program evaluation is student satisfaction with student support services available from the programs. Listed in order of frequency, respondents indicated receiving job search instruction or assistance (four respondents), help with personal/life challenges (four respondents), career counseling (three respondents), and academic advising (one respondent) (see Exhibit 27). Program participants who had received these support services tended to be satisfied with them, although the very small number of responses should not be used to draw conclusions. When asked to provide ideas about how to improve support services, one respondent said that he or she would like more information on available jobs in the HIT field.

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**Exhibit 27:**
**Receipt of Student Support Services**



Bar chart showing values:
- Career information / career counseling: 3
- Academic support services: 1
- Help with any personal challenges you face while in the program: 4
- Job search instruction or assistance: 4

**Base: All respondents (n=11)**

*Survey of Current HIT Students (Round 1)*

The survey also included open-ended questions designed to obtain students' opinions about the strongest and weakest features of the program, together with suggestions for program improvement. Overall, the tenor of the responses was tilted toward the negative, as the number of negative comments significantly outnumbered the number of positive ones.

The most frequent complaint voiced by students was that the quality of instruction did not meet their expectations. Some respondents said the faculty were unavailable, inconsistent in grading, and had insufficient knowledge of the material. Two students were critical of the technology used for instruction. One student said that the virtualization systems (such as VMware environments)[6] used for instruction were ready only long after the course had started and another complained that the hardware used for instruction was not the "required hardware for today's technologies." Two other students thought the program did not include enough IT content. Finally, one student thought that having the main courses taught only online limited the possibilities for interaction among classmates and between students and instructors.

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[6]  Operating system virtualization refers to the use of software to allow system hardware to run multiple instances of different operating systems concurrently, allowing users to run different applications requiring different operating systems on one computer system.

Among the positive comments, a few students appreciated the online delivery of program content, which permitted them flexibility in fitting their coursework into their schedule. A few other students said the instructors were knowledgeable and helpful; one respondent, for example, made the following comment: "Having the teacher deeply involved in the class makes the learning experience easier and more engaging."

The most frequently mentioned suggestion for improvement was moving to an instructional mode that would allow for more student interaction and discussion. Several students expressed interest in having more of the course content taught in a classroom setting rather than online—especially when covering issues such as policies, legal information, and the Health Insurance Portability and Accountability Act (HIPAA), where the ability to interact with the instructor was considered more important. Several other students said that the computer systems need to be upgraded, and that instructors should be better prepared.

## Findings from Program Completers

Although students invited to participate in the HIT program completer survey responded at a relatively high rate (50 percent), the number of survey respondents was quite small (n=12), due to the small number of individuals who had completed one of the programs at the time of the survey.
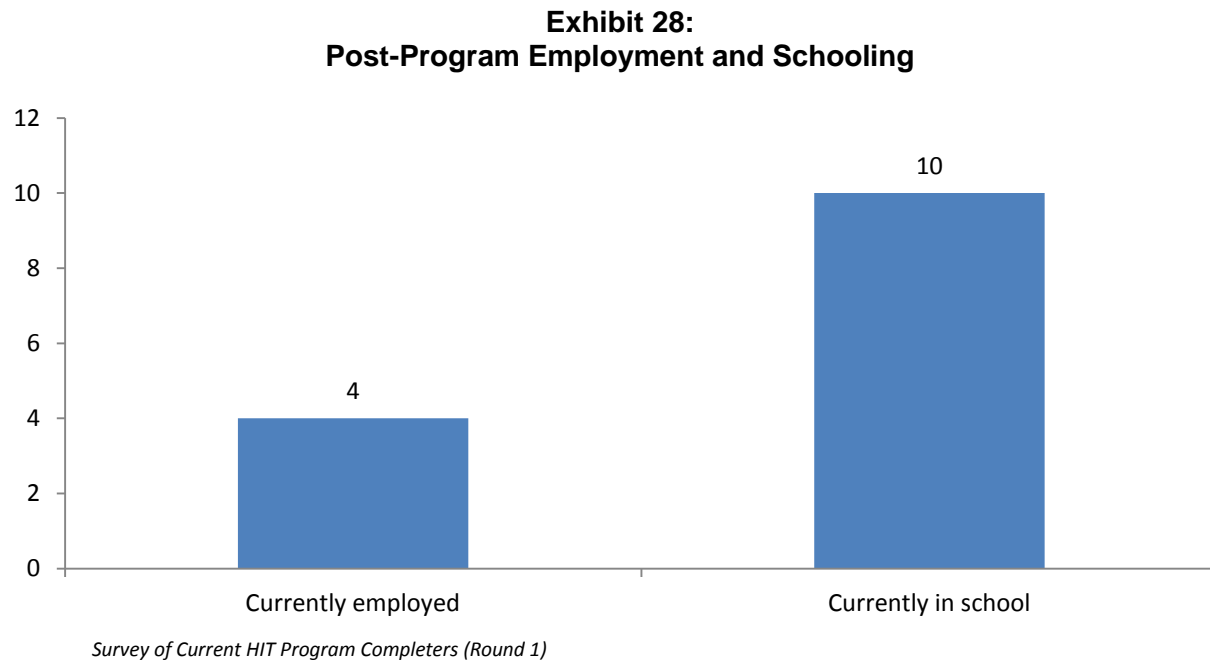
Issues of particular interest to the evaluation included the following:

- whether program completers were working in a field related to their training or continuing their education in a related field;

- the extent to which training in the HIT program had been of value in looking for employment in an HIT-related job;

- the proportion of respondents who expected to be working in an HIT-related field in five years;

- overall satisfaction with the program and opinions about the value of particular program features; and

- recommendations for improving the program.

### Post-Program Employment and Educational Experiences

Only four of the HIT completers we interviewed were employed at the time of the interview (see Exhibit 28 below). An important observation puts this figure in perspective: for many students, the HIT certificate that signaled the end of the grant-funded curriculum was only an intermediate step in their completion of an associate's degree in a related program at the same college. In other words, these students were still in the midst of completing a higher-level degree in a related educational program. This explains the relatively low number of respondents who were
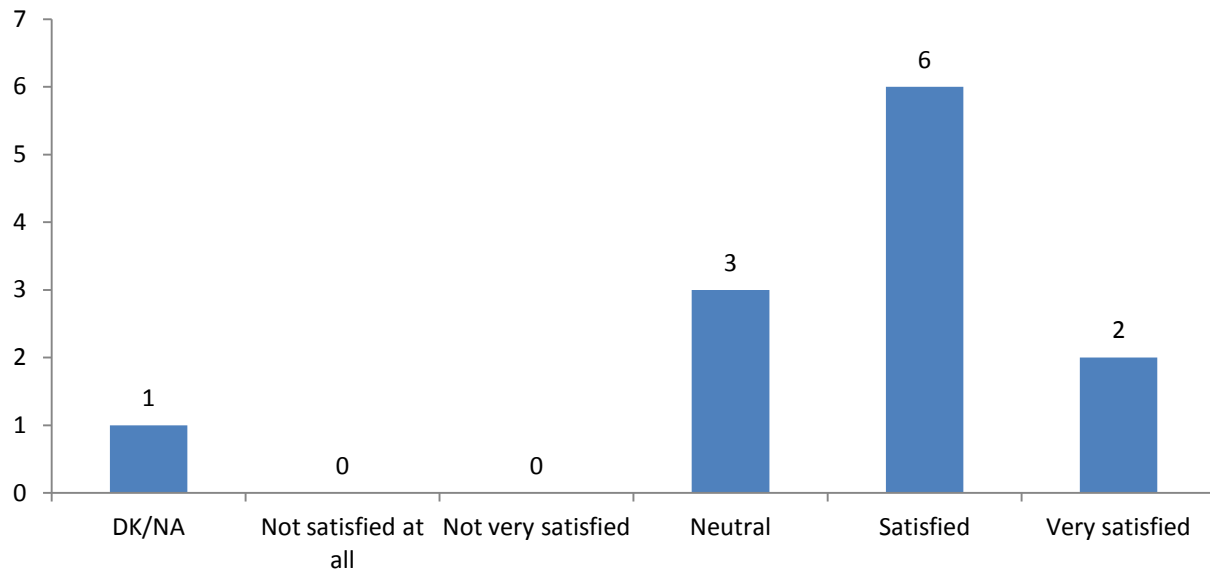
employed in HIT jobs and also the high number of HIT completers who were still in school (see Exhibit 28):

**Exhibit 28:**
**Post-Program Employment and Schooling**



*Survey of Current HIT Program Completers (Round 1)*

## Satisfaction with the Program and Suggestions for Improvement

A majority of respondents (eight) said they were either "very satisfied" or "satisfied" with their program (see Exhibit 29). This positive assessment by program completers may be influenced by either the small size of the respondent group or the particular nature of the cohort studied. Being satisfied with the program might reflect the fact that most of the twelve HIT completers who were surveyed had not yet started the process of seeking employment in an occupation related to their training. Once the pool of HIT completers grows, and as completers encounter the realities of the job market, program satisfaction scores may change.

**Exhibit 29:**
**Overall Satisfaction with Program**



*Survey of Current HIT Program Completers (Round 1)*

Respondents also provided suggestions for improving their HIT programs.  The most frequent recommendation was to expand hands-on learning in order to better prepare students for the realities of the workplace.  Strategies recommended for doing this included using better-equipped labs with technology that would mimic or approximate the technology currently present in health IT settings, providing more exposure to different EHR platforms, and collaborating with local clinics/hospitals to create more opportunities for internships.  Another suggestion was to promote post-program employment by facilitating connections between employers, recruiters, and program completers, and by dedicating some class time to resume preparation and the hiring practices and work culture specific to health IT jobs.

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# APPENDIX A.  COMPARISON BETWEEN POTENTIAL AND ACTUAL SURVEY RESPONDENTS

The study team investigated the possibility that the relatively low response rate for the surveys (especially for the web-based surveys of current program participants) might have resulted in biased survey findings as the result of differences between the characteristics of survey respondents and the characteristics of the full pool of eligible survey participants.  To estimate the extent of potential non-response bias, we compared each of the types of survey respondents (HIT program current students, HIT program completers, Nursing and Allied Health program current students, and Nursing and Allied Health program completers) to their respective group of potential survey participants.  The variables used for comparison were obtained from administrative data collected by the HeW Consortium, and were available for all potential survey participants.  The evaluators included all the variables that were believed to be potentially associated with survey responses and that were available at the time the analysis was conducted.  These variables included age, gender, race and ethnicity, student status (full-time versus part-time), Trade Adjustment Assistance (TAA) status, and veteran status. As described in Table A, below, the differences between actual and potential survey respondents tended to be small for the Nursing and Allied Health program groups.  Differences between HIT potential and actual respondents tended to be somewhat larger, especially in regards to age distribution.

In order to assess the level of non-response bias present in the data, the evaluators used post-stratification weighting, a technique that adjusts survey responses to account for differences between respondents and non-respondents on multiple characteristics.  For both Nursing and Allied Health program groups, post-stratification weights were computed based on age group, gender, ethnicity, student status, and veteran status.  A comparison of weighted and un-weighted survey results for all the variables included in this report found that the two sets of results differed little (generally the results were within 3 percentage points of one another).[7]   Because of the small differences, we estimate the level of non-response bias to be low.  Given this, we opted to report the unweighted survey responses in the main text, primarily because such raw counts are more easily interpretable than weighted responses.

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[7]   Results are available upon request.

In contrast, in the case of the HIT program, the very small number in the respondent groups (both current participants and completers), reduced the reliability of the non-response bias adjustments.  As a result, post-stratification weights were not generated for these groups.  As sample sizes increase in future survey waves, we plan to conduct such analyses. [8]

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[8]   The above analyses do not preclude the existence of non-response bias caused by student characteristics that were not measured.  Although the analyses were based on data available for potential and actual survey respondents, it is possible that potential and actual survey respondents differed based on characteristics that were unmeasured (for example, the level of student motivation).  If that were true, unmeasured differences could also cause significant non-response bias.

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**Table A**
**Comparison between the Main Characteristics of Survey Respondents and Population**

| | Nursing And Allied Health Programs | | | | HIT Programs | | | |
| | Current Participants | | Completers | | Current Participants | | Completers | |
| | Respondents (n=138) | Universe (n=624) | Respondents (n=97) | Universe (n=305) | Respondents (n=11) | Universe (n=51) | Respondents (n=12) | Universe (n=56) |
|---|---|---|---|---|---|---|---|---|
| **Age Groups** | % | % | % | % | % | % | % | % |
| 18-25 years | 30.9 | 32.1 | 31.4 | 29.8 | 18.2 | 17.7 | 8.3 | 15.4 |
| 26-30 years | 45.6 | 48.5 | 47.1 | 51.5 | 36.4 | 51.0 | 33.3 | 46.2 |
| 30+ years | 23.5 | 19.4 | 21.6 | 18.7 | 45.5 | 31.4 | 58.3 | 38.5 |
| **Gender** | | | | | | | | |
| Male | 16.7 | 20.5 | 22.6 | 18.4 | 81.8 | 78.4 | 83.3 | 76.9 |
| Female | 83.3 | 79.5 | 77.5 | 81.6 | 18.2 | 21.6 | 16.7 | 23.1 |
| **Ethnicity** | | | | | | | | |
| Hispanic | 7.3 | 4.4 | 2.9 | 5.9 | 9.1 | 8.5 | 8.3 | 4.0 |
| Asian | 7.3 | 10.3 | 12.8 | 13.2 | 0.0 | 4.3 | 8.3 | 8.0 |
| African-American | 2.2 | 3.6 | 2.9 | 4.3 | 0.0 | 2.1 | 0.0 | 0.0 |
| White | 74.5 | 75.6 | 75.5 | 70.6 | 90.9 | 83.0 | 83.3 | 80.0 |
| Other | 8.8 | 6.2 | 5.9 | 5.9 | 0.0 | 2.1 | 0.0 | 8.0 |
| **Student Status** | | | | | | | | |
| Full-time | 94.9 | 95.0 | 92.2 | 90.2 | 81.8 | 82.4 | 83.3 | 80.8 |
| Part-time | 5.1 | 5.0 | 7.8 | 9.8 | 18.2 | 17.7 | 16.7 | 19.2 |
| **Veterans** | | | | | | | | |
| Yes | 4.4 | 5.5 | 2.3 | 2.0 | 18.2 | 19.6 | 25.0 | 26.9 |
| No | 95.6 | 94.5 | 97.7 | 98.0 | 81.8 | 80.4 | 75.0 | 73.1 |

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# APPENDIX B.  BELLEVUE COLLEGE CONSORTIUM'S HEALTH E-WORKFORCE EVALUATION DATA REPORT