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Access to Health Information Technology Training Programs at the Community College Level

KEY FINDINGS

Findings from a 2013 survey of health information technology (HIT) workforce development programs in community colleges across the U.S. included:

- Most (92%) community colleges with HIT programs offered associate degrees, 72% offered college credit non-degree courses, and 15% offered non-degree/non-credit courses on HIT topics.
- Overall, nearly three-quarters used distance-learning methods either solely or in combination with in-person classroom instruction to deliver their HIT courses. Higher percentages of not-for-credit courses were delivered using distance-learning methods than for-credit, non-degree programs or degree granting programs.
- Community colleges reported they actively encouraged students from underserved populations to enroll in their community college HIT courses: about two-thirds reported active recruitment of rural students (65%), veterans (67%), incumbent workers (66%), dislocated (unemployed) workers (69%), and historically underserved racial/ethnic minorities (69%).
- Student enrollment in community college HIT programs stayed the same or grew for most of the underserved population groups (listed above) over the past three years.
- "Inadequate recruiting resources" was the top-cited barrier (reported by 59% of colleges as a major or minor barrier) to recruiting and enrolling students in general.
- Top barriers for recruiting rural students were "limited HIT job opportunities in rural areas" (80%) and "rural students find it difficult to relocate or commute to campus-sited programs" (69%).
- Community colleges cited students' limited internet access or bandwidth constraints as a major (10%) or minor (47%) barrier to the use of distance-learning education methods.
- Most community college HIT curriculum was designed, at least in part, by the colleges' faculty. Fewer than a fifth of the colleges reported adapting curriculum that was developed through the Office of the National Coordinator for HIT's community college curriculum development program.
- Nearly half of community college HIT programs used electronic health record (EHR) training labs for their "hands on" practical learning. More than half of the colleges cited the expense and limited access to vendor or healthcare system EHRs was cited as a barrier (major or minor) to EHR training.
- Colleges reported that a significant barrier to accessing required professional practice experience (PPE) sites was the shortage of PPE sites/collaborators (82% cited as a major or minor barrier).
- A majority of colleges tracked student employment in HIT jobs after program completion, but many did not know their students' employment trajectory. About three-quarters of colleges reported knowing whether their students were working in HIT-related jobs after completing programs at their colleges, but only 36% reported having information about whether or not their students were working in rural areas.

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BACKGROUND

The demand for workers with skills in the implementation and use of health information technology (HIT) was fueled in 2009 by passage of the U.S. Health Information Technology for Economic and Clinical Health Act, (the HITECH Act) enacted under Title XIII of the American Recovery and Reinvestment Act of 2009.[1] The HITECH Act invested $25.9 billion to promote HIT adoption by the health care industry. A well-trained HIT-workforce is required for successful implementation of the HITECH Act and promotion of effective use of HIT.

Community colleges are key resources for developing the nation's health workforce, especially for allied health and nursing occupations.[2] A majority of community colleges provide health career degree programs, but in addition many deliver courses (for-credit and not-for-credit) that enhance the skill sets of health care workers. From 2007 to 2009 there were 346 health information/medical records technician programs in community colleges across the U.S., and approximately 4,400 students completed programs in those institutions annually.[3] The Office of the National Coordinator for HIT (ONC) in 2010 implemented $116 million in programs to develop continuing education programs delivered by community colleges, as well as university-based graduate-level education programs to build the HIT workforce.[4]

Access to classroom-based community college education programs can be difficult for incumbent workers and for students, such as rural residents, who are not in close proximity of the institutions. A 2012 survey of rural primary care practices across the U.S. found that most relied on their existing staff to implement HIT systems, but nearly two-thirds needed access to more training for their staff in electronic health records (EHR) use and HIT-related skills.[5] Among the top barriers to obtaining EHR/HIT-related skills cited by the rural practices was limited availability of community college HIT training and limited online/Web-based training in the use of EHRs and HIT. In order to help meet these needs, more information is needed about how and whether community colleges design their HIT programs in ways that support enrollment by students who have access limitations, such as rural students and incumbent workers.

As with most academic institutions, community colleges have been increasingly adopting distance-learning methods to deliver their courses, either entirely or in concert with classroom-based programs. The community-college curriculum developed under the ONC initiative was implemented through a consortium of 82 community colleges across the U.S. using non-degree programs, largely via web-based/distance education curricula developed as part of the initiative. Increasing the number of HIT education programs and the number accessible through distance-learning methods should improve access for many types of students, especially those who are time- and/or place-bound.

The goal of this study was to examine HIT workforce development programs in community colleges in order to increase understanding of the types of programs offered, describe the characteristics and sources of community college HIT curricula, highlight how these programs may be reaching underserved populations and students with limitations to accessing classroom-based courses, and identify barriers faced by these programs in achieving their HIT education goals. Information about the

strengths and needs of the nation's community college HIT education programs should help inform future HIT skills training programs and contribute to growing and strengthening the HIT workforce.

DATA SOURCES AND METHODOLOGY

This study conducted and analyzed data from a 2013 survey of community colleges in the U.S. offering HIT education and training. This study was reviewed and approved by the University of Washington Human Subjects Division. HIT program directors were the targeted respondents.

Survey sample: Community colleges offering a health information technology-related program were initially identified through the federal Integrated Postsecondary Education Data System (IPEDS).[6] Institutions were determined to be community colleges if their institutional category in IPEDS in 2010 was "degree-granting, not primarily baccalaureate or above" or "degree-granting, associate's and certificates," similar to methods used by Skillman et al., 2012.[7] Colleges were defined as offering a health information technology associate degree if they had a Classification of Instructional Programs (CIP) code of 51.0707 ("Health Information/Medical Records Technology/Technician")[8] or if they offered a Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM)-accredited associate degree in the 2012-2013 academic year. The IPEDS data available at the time of the survey reflected data from institutions' 2010- 2011 academic year. In order to identify relevant programs that opened in institutions after 2011, we used a list of all CAHIIM-accredited associate degree programs at community college-level institutions that were not among the IPEDS programs. We included these additional programs, resulting in a total of 357 programs. Ten institutions were excluded from this sample because they either no longer offered an HIT program or the institution was out of business. The resulting final sample frame for the survey was 347 institutions with active HIT programs.

Questionnaire: Survey questions were developed to assess the levels and content of HIT-related programs, barriers to accessing these programs, and summary information on methods for delivery, curriculum offerings/requirements, student levels/recruitment and student tracking. The resulting questionnaire was piloted using seven stakeholders in HIT education in February, 2013. Feedback was incorporated to create a final version of the instrument, which was printed as a 6-page paper questionnaire and programmed for online access using Qualtrics online survey software. The Qualtrics version of the questionnaire was tested for accuracy and likeness to the paper design. The questionnaire can be viewed at http://depts.washington.edu/uwchws/pdfs/HITEducationApr-22-13.pdf (case sensitive).

Survey implementation and response: Email addresses for the HIT program directors were identified (or dean/faculty member where no HIT program director was identifiable) by the study team from reviews of institutions' websites. These primary contacts were contacted by email in February, 2013, followed by a reminder one week later. Those who did not respond to the email invitations within a month were sent the paper questionnaire by U.S. mail. Where available, additional invitations were sent as needed to secondary contacts at the institution. In May 2013, non-respondents to email and U.S. mail invitations were contacted by phone and offered participation online or by the paper questionnaire.

Of those 347 institutions including in the original sample, 23 were determined to be out of scope because they no longer offered an HIT program (22) or were located outside the U.S. (1). The final 234 respondents included 219 from the online system and 15 on paper, yielding a 72.2% response rate.

Compared with non-respondents, respondents were more likely to be public institutions ($p \leq 0.001$). There were no significant differences between respondents and non-respondents in terms of degree granting category or geographic region.

Statistical analyses: Statistical analyses were conducted with SPSS 21 and SAS 9.3. Most of the results shown in this report are based on valid responses (i.e., missing values and "not applicable" responses were excluded). Further information is available from the authors.

RESULTS

Most community college HIT programs conferred associate degrees, but many also offered non-degree HIT courses for credit and not-for-credit

Most (91.8%) responding community colleges offered associate degree HIT-related programs (Table 1). Nearly three-quarters (71.9%) offered HIT related non-degree programs and 14.7% offered not-for-credit HIT-related programs. A quarter of the colleges (25.0%) only offered programs at the associate degree level while half (53.1%) offered both associate degree and non-degree programs (data not tabled). Only 11.0% of colleges offered all three levels: associate degree, non-degree and not-for-credit courses.

Table 1. Type of HIT programs and course topics and education delivery methods provided by U.S. community colleges, 2013

Type of HIT program/course provided	Community colleges providing HIT programs/courses: # of colleges	% of programs	% of course type	HIT program/course delivery method: % all in-person	% hybrid (in-person and distance learning)	% all distance learning
Associate degree programs:	**212**	**91.8%**		**22.1%**	**55.4%**	**22.6%**
Health information technology	160		75.5%	23.6%	52.7%	23.6%
Health information management	45		21.2%	8.3%	61.1%	30.6%
Other	32		15.1%	29.6%	51.9%	18.5%
For-credit courses, non-degree	**166**	**71.9%**		**23.2%**	**54.9%**	**21.8%**
Coding, billing	145		87.3%	26.0%	52.0%	22.0%
Clinical documentation improvement	26		15.7%	23.1%	61.5%	15.4%
Cancer registry	8		4.8%	25.0%	25.0%	50.0%
Health data analyst	29		17.5%	15.4%	61.5%	23.1%
Health information technology	80		48.2%	26.3%	47.4%	26.3%
Other	39		23.5%	25.0%	40.6%	34.4%
Not-for-credit courses	**34**	**14.7%**		**15.6%**	**28.1%**	**56.3%**
Practice flow/Information management redesign specialist	18		52.9%	5.9%	23.5%	70.6%
Clinician/practitioner consultant	14		41.2%	0%	9.1%	90.9%
Implementation support specialist	13		38.2%	0%	27.3%	72.7%
Implementation manager	13		38.2%	0%	16.7%	83.3%
Technical/software support staff	16		47.1%	14.3%	21.4%	64.3%
Trainer	13		38.2%	0%	8.3%	91.7%
Other	9		26.5%	25.0%	37.5%	37.5%

Among community colleges with associate degree HIT programs, three-quarters were in health information technology and more than a fifth (21.2%) were in health information management (Table 1). Among the colleges with for-credit, non-degree HIT course offerings, the majority (87.3%) offered coding and billing courses and about half (48.2%) had health information technology courses. Other course topics were offered for credit, but at much lower frequencies. Not-for-credit HIT courses, among the 14.7% of colleges offering them, covered the roles included in the ONC community college curriculum: practice flow/information management redesign specialist, technical/software support staff, clinician/practitioner consultant, implementation support specialist, implementation support manager, and trainer.

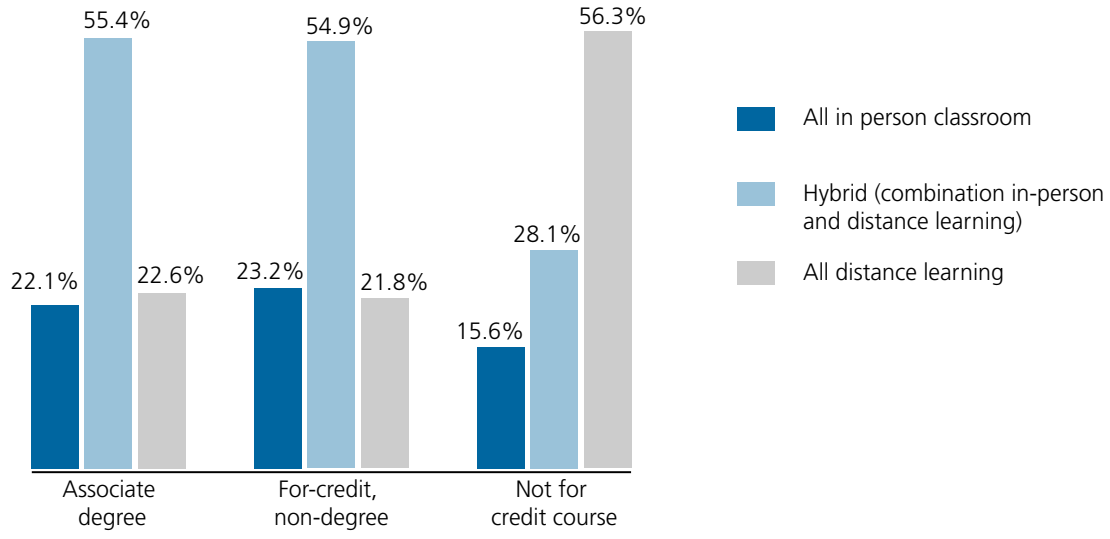
Nearly three quarters of community college HIT education programs used distance-learning methods

Community college HIT programs were asked if student access to their programs and courses was all through in-person/classroom instruction, all via distance learning (e.g., internet/web, video-conference, Skype), or a hybrid of in-person/classroom and distance learning. Use of an online Learning Management System (such as Moodle or Blackboard) to supplement classroom instruction did not qualify as distance learning. Roughly three-quarters of programs (72.6%) used distance learning (either hybrid, or all-distance) (data not tabled). Higher percentages of the not-for-credit courses were delivered entirely using distance-learning methods compared with for-credit non-degree courses and associate degree programs (Table 1 and Figure 1).

A majority of programs actively encouraged students from underserved populations to enroll in community college HIT courses

Roughly two-thirds of community college HIT program respondents reported "actively encouraging the enrollment of" the following specific student groups: rural (64.6%), veterans (67.2%), historically underserved racial/ethnic minority students (64.6%), incumbent (currently employed) workers (66.2%), and dislocated (unemployed) workers (68.7%) (data not tabled).

Figure 1. HIT program/course delivery methods used to deliver HIT courses in community colleges, by program type



Student enrollment has stayed the same or grown overall and for most student subgroups over the past three years

Just over half (52.6%) of the community colleges with HIT programs reported that the overall number of students in the prior 3 years had increased (Table 2). A similar percentage (50.3%) indicated that the number of students accessing programs using distance learning had increased in the prior 3 years. Nearly three-quarters of colleges (73.7%) reporting an increase in students also reported an increase in students using distance learning methods to access courses (data not tabled). The vast majority of colleges reported that the overall number of students, students from underserved populations including rural areas, as well as students intending to work in rural areas had either increased or stayed the same.

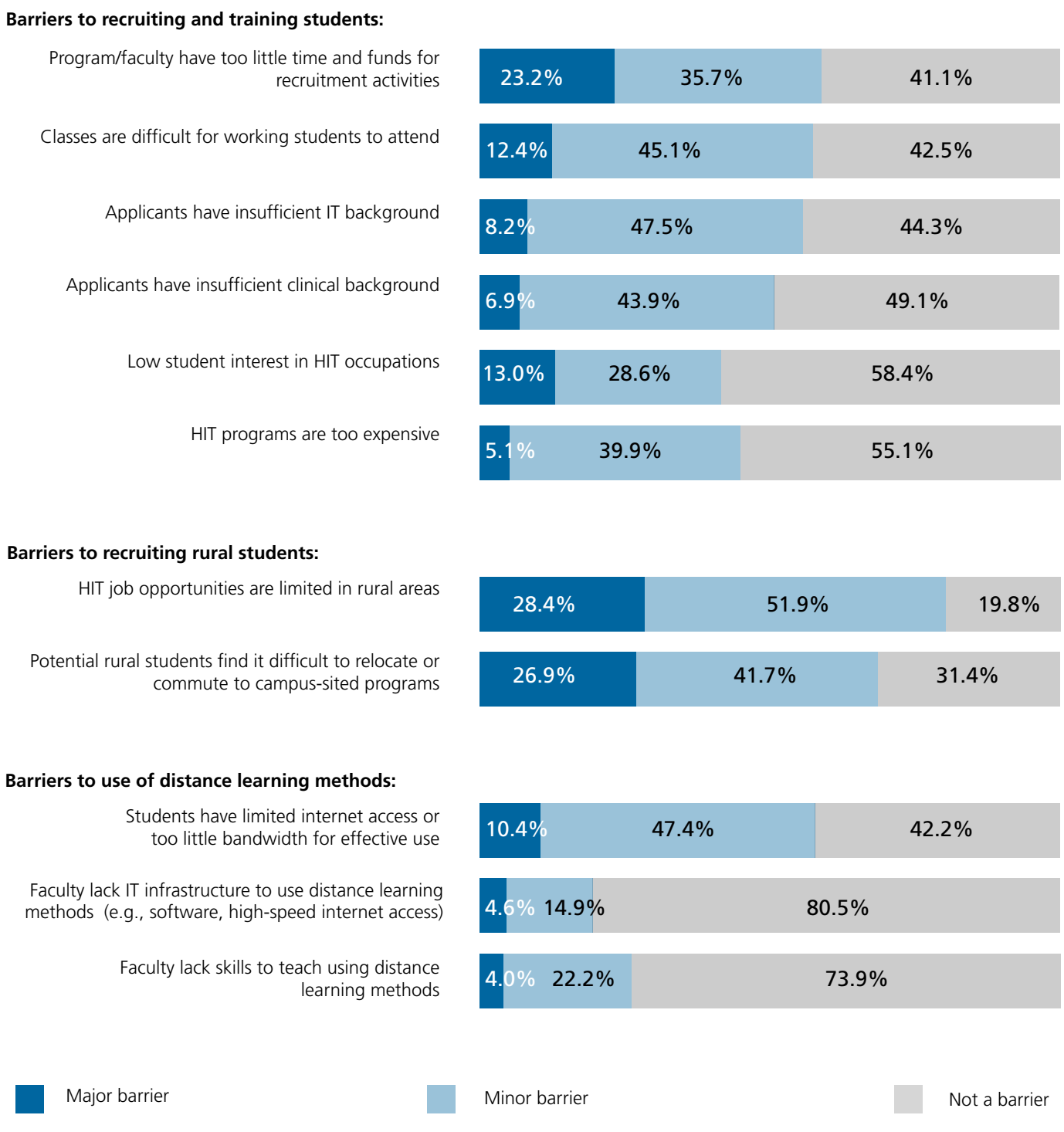
Table 2. Changes in the number and types of students completing community college HIT programs in the past three years

	Number of students completing programs in the past 3 years:			
	Has increased	Has stayed the same	Has decreased	Don't know
Students overall	52.6%	29.6%	15.3%	2.6%
Students from rural areas	19.9%	48.1%	3.9%	28.2%
Planning to work in rural areas	8.8%	42.0%	5.5%	43.6%
Students accessing programs using distance learning	50.3%	38.1%	1.4%	10.2%
Veterans	25.0%	37.2%	4.4%	33.3%
Historically underserved racial/ethnic minority students	21.9%	51.0%	2.1%	25.0%
Incumbent (currently employed) students	35.8%	40.5%	4.7%	18.9%
Dislocated (unemployed) workers	46.0%	32.1%	4.8%	17.1%

Rural students were reported to face some major hurdles, and limited internet access and bandwidth posed a barrier to distance learning for many colleges

Few of the factors presented in the survey questionnaire were reported to be "major" barriers to recruiting students to colleges' HIT programs (Figure 2). Several factors, however, were reported by about 50-60% of colleges to be either a "major" or a "minor" barrier, including: program/faculty time and funds for recruitment, classes difficult for working students to attend, applicants having insufficient IT background, and applicants having insufficient clinical background.

Figure 2. Barriers to recruiting and training students in community college HIT programs



Among colleges interested in recruiting rural students, the factor cited as a major or minor barrier by the highest percentage of colleges (80.3%) was "HIT job opportunities are limited in rural areas." More than two thirds (68.6%) cited "potential rural students find it difficult to relocate or commute to campus-sited programs" as a major or minor barrier to recruiting rural students.

When asked about barriers to using distance learning, student bandwidth was considered the greatest barrier with 57.8% of colleges reporting it as a major or minor barrier (Figure 3). Almost 20% of colleges said that faculty's lack of infrastructure was a barrier to distance learning, yet 26.2% indicated faculty skills as a barrier.

COMMUNITY COLLEGE HIT CURRICULUM

Most community college curriculum was designed, at least in part, by colleges' faculty

More than three-quarters of the colleges reported that their faculty was involved in developing the vast majority of their HIT curriculum (Table 3). The ONC began HIT curriculum development programs for community colleges in 2010. Survey respondents were asked about the sources of their HIT curriculum across eight key domains that were determined by reviewing the ONC curriculum and the accrediting body guidance, with input from the authors and key informants. ONC curriculum was adopted, by domain, by no greater than 15% of colleges offering that domain, and slightly higher percentages of colleges adapted curriculum from other institutions or other sources.

Table 3. Source of curriculum by domain among community college HIT programs

Curriculum domain	% (n) of colleges offering curriculum domain	Curriculum source (among colleges offering)*				
		Designed by faculty	Adapted from one or more other institutions' curriculum	Adapted from ONC** Community College -Curriculum	Other source	Don't know
Introduction to healthcare delivery systems	85.9% (201)	84.8%	11.4%	8.2%	11.4%	3.8%
Health information management systems (e.g., EHR, meaningful use)	86.3% (202)	82.5%	9.8%	12.0%	11.5%	3.8%
Information systems technology (e.g., health IT systems, networking, databases)	80.8% (189)	77.8%	12.3%	11.7%	10.5%	5.3%
Quality management and performance improvement	79.9% (187)	84.6%	10.7%	8.3%	10.1%	3.6%
Privacy and security	81.6% (191)	84.5%	11.5%	8.6%	10.3%	3.4%
Coding and reimbursement	87.6% (205)	83.9%	11.3%	4.8%	9.7%	4.3%
Project/change management and work-force redesign	62.8% (147)	75.2%	10.9%	15.3%	10.9%	6.6%
Organizational resources (e.g., human resources, financial management)	75.6% (177)	82.5%	12.5%	6.9%	10.6%	4.4%

*Totals exceed 100% because more than one response could be selected.
**Office of the National Coordinator for Health Information Technology

EHR training labs were used by nearly half of community college HIT programs for "hands on" practical learning

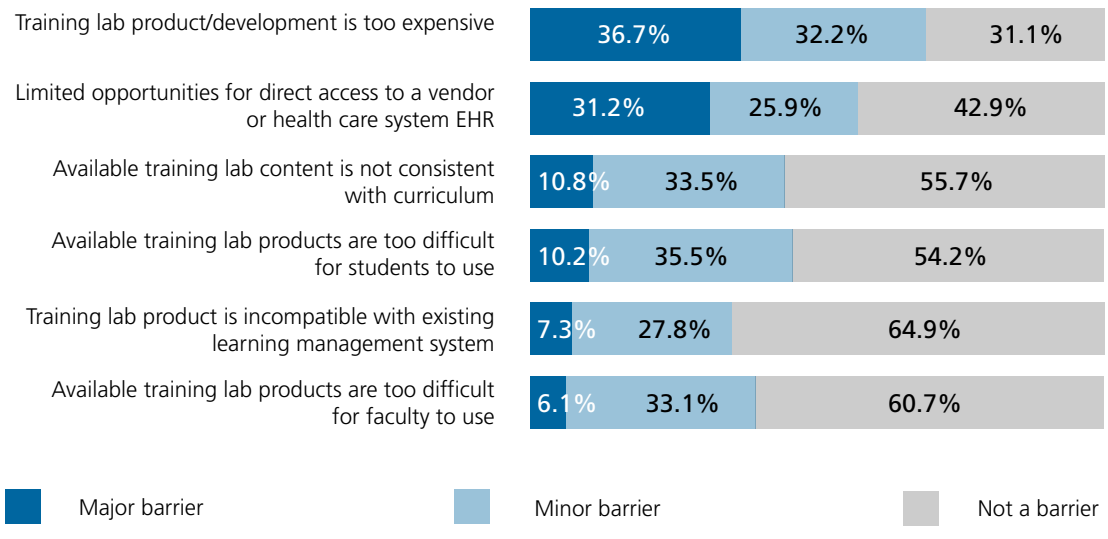
Students in HIT programs generally require access to hands-on or practical electronic health record (EHR) training, usually through a training lab or by access to a vendor's or healthcare system's EHR. Only 14.8% of survey respondents used a vendor or health care system's EHR for this purpose, while nearly half (49.3%) reported using an EHR training lab (data not tabled). Another 30.1% of colleges reported using another method of hands-on or practical EHR training. Surprisingly, 5.7% said they did not provide any hands-on or practical EHR training.

Among the colleges using training labs, the majority (68.5%) used the American Health Information Management Association (AHIMA) virtual lab, 18.5% used a lab developed by their institution or faculty, and 10.9% used NeehrPerfect. VistA, a training lab developed by the ONC, was used by 7.6% of colleges using training labs and 15.2% indicated they used another training lab not among those listed (data not tabled). Percentages add up to more than 100% because more than one option could be selected.

EHR training barriers included expense and limited access to vendor or healthcare system EHRs

More than half (57.1%) of the community colleges with HIT programs reported that a major or minor barrier to EHR training for their students was "limited opportunities for direct access to a vendor or health care system EHR" (Figure 3). Other barriers reported at somewhat lower percentages were not having training lab content that was consistent with the college's curriculum, training products that were too difficult for the students to use, training lab products that were inconsistent with the college's learning management system, and products that were too difficult for the faculty to use.

Figure 3. Barriers to EHR training for community college HIT programs

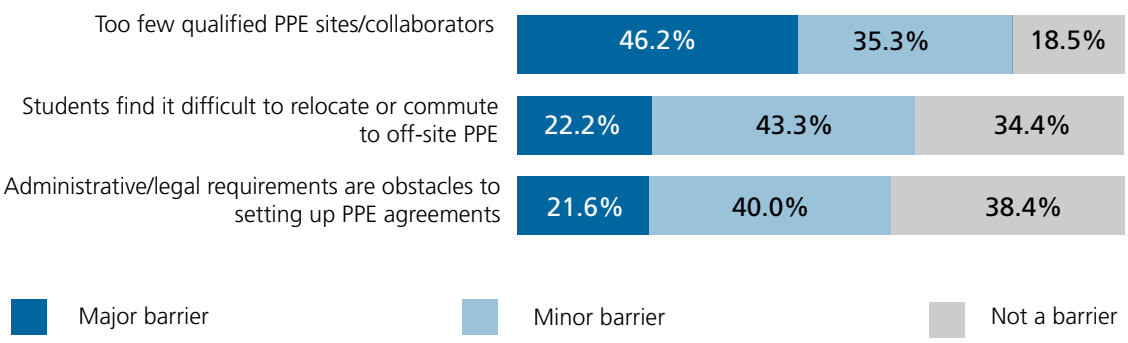


Many barriers to accessing professional practice experience were reported by community college HIT programs

Professional practice experience (PPE) is field-based learning (an internship, affiliation or practicum) that accompanies a student's education program. Students are typically placed in a traditional work setting and are expected to work a defined number of hours to complete their degree. Most colleges (87.3%) reported that they required PPE. Of those, 64.2% had PPE programs that were all conducted live, 2.3% were conducted all virtually, and 33.5% were conducted using a hybrid live and virtual approach (data not tabled).

Among the colleges with PPE requirements, most (81.5%) indicated that a major or minor barrier to accessing PPE was that there were "too few qualified PPE sites/collaborators" (Figure 4). Two-thirds (65.5%) reported "students find it difficult to relocate or commute to off-site PPE", and 61.6% reported "administrative/legal requirements are obstacles to setting up PPE agreements" as major or minor barriers.

Figure 4. Barriers to accessing professional practice experience (PPE) for community college HIT education programs



A majority of colleges tracked student employment in HIT jobs after program completion, but many colleges did not know their students' employment trajectory

Of the 198 colleges who responded to questions about their students' work status and location six months after completing HIT programs, more than a quarter (27.3%) did not know if their students were employed in HIT-related jobs, and nearly two thirds (64.1%) did not know if their students were working in rural areas (Table 4). Just under half (46.5%) of colleges reported that most (75-100%) of their students obtained HIT-related jobs within six months of completing their program and only 8.6% reported that most students who had completed their program were working in rural areas.

Table 4. Estimates of students obtaining HIT-related jobs and students working in rural areas within six months of completing a community college HIT program

	Student employment after program completion, by percent of colleges reporting (n=198)					
	0% of students	1-24% of students	25-49% of students	50-74% of students	75-100% of students	Don't know
Students obtaining HIT-related jobs within 6 months of program completion	0%	2.0%	5.1%	19.2%	46.5%	27.3%
Students working in rural areas within 6 months of program completion	3.0%	16.2%	3.0%	5.1%	8.6%	64.1%

CONCLUSIONS AND POLICY IMPLICATIONS

Students can access community college HIT programs at several academic levels: by completing degree programs; taking for-credit courses; and taking not-for-credit, non-degree courses. This study documents that distance-learning methods are used, entirely or in part, by most community college HIT programs, which likely helps to facilitate access by students with access limitations, such as incumbent workers and students in rural areas. More than half of responding colleges reported increases in the overall number of students completing HIT courses, the number of dislocated students in HIT courses, and the number using distance-learning methods. A majority of colleges indicated, however, that limited internet access or bandwidth constraints were barriers, to at least a minor degree, to using distance-learning methods.

While the majority of colleges reported that they actively encouraged enrollment of students from rural areas, veterans, incumbent workers, dislocated workers and historically underserved racial/ethnic minorities, a majority also cited having too little time and resources as a barrier to recruiting. From these responses one might infer that with more resources for the purpose, the colleges could enhance their outreach, including to underserved student populations. For example, while HIT can be promoted as a first career, the HIT field is often an attractive second career choice – an area where there is less recruitment attention. In addition, when high school health advisors or counselors guide students to the health care industry they often describe the field as largely composed of clinical careers, overlooking the HIT field that combines computer science with healthcare.

In rural areas, some of the need for enhanced community college-based HIT skills training resources is being addressed by a rural HIT workforce development program, through the federal Health Resources and Services Administration (HRSA). Introduced in 2013, this three-year program is deploying $4.4 million a year to 15 states for recruiting and training current health care staff, local unemployed workers, rural veterans and others to help meet rural health care needs.[9] Among the program's goals are expanding the rural HIT workforce and use of telehealth by supporting the development of rural-focused community college HIT training programs.

In July 2015 the ONC announced additional cooperative agreement awards to update the existing HIT training curriculum, intended to align with the Department of Health and Human Services' goals for health reform, as well as develop new curriculum focused on population health, care coordination, new care delivery and payment models, and value-based and patient-centered care.[10] The goal of this program is to train a wide variety of incumbent health care workers to use EHRs/HIT to improve the quality of care delivery and meet the requirements of the changing healthcare delivery system.

Other barriers cited by community colleges included the expense of training labs and limited access to vendors' and healthcare providers' systems that are required for the "hands-on" instruction components of their HIT programs. In addition, more than 80% reported problems accessing the number of PPE sites needed for their programs. These access problems are not dissimilar to the access problems for clinical training sites faced by many (if not most) clinical professions' education programs.[11] Health care delivery sites must be motivated to provide clinical training because of the considerable staff time and resources required. Healthcare providers are most likely to be motivated during times of significant workforce shortages, when training is seen as likely path to employment at the site, and when clinical leadership recognizes their social role in educating the next generation of health care providers.

The findings that less than a fifth of community college respondents were using any of the components of the ONC community college HIT curriculum, and fewer than 8% were using the training lab developed by ONC, merit consideration. The ONC curriculum was developed for short term, non-degree courses and these low adoption rates could be related to the finding that more than a quarter of responding colleges did not offer non-credit courses. Adopting the curriculum in for-credit classes presents two major challenges. First, all of the ONC curriculum has been made publicly available which means that the teaching materials, including test question banks and the answers, are accessible to students as well as faculty. A program's academic integrity can be threatened by such accessibility. In addition, adoption of the ONC curriculum has been hindered because access involves many steps to download each section to search for relevant elements, and there are limited connections between the ONC curriculum and textbooks or learning manuals, student workbooks, etc. In addition, a 2014 study of users of the ONC curriculum (in four-year and community colleges) found that only a small percentage (5%) made no changes to the downloaded curricular course material.[12] This could have led to some recall bias by respondents toward attributing college faculty with sole credit for developing their curriculum.

Continued efforts are needed to enhance community colleges' ability to deliver HIT education and training programs. These efforts include expanding access through distance learning and increasing hands-on training opportunities. These strategies will help more students (those new to healthcare as well as incumbent healthcare workers) to obtain the basic HIT skills and the updated HIT proficiencies required to meet the information needs of our rapidly changing healthcare delivery system.

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