



BREAKING THE CYCLE REPLICATION GUIDE

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Table of Contents

Introduction	6
Purpose of the Grant Program.....	7
Program Training Options.....	8
Cohorts Program	8
Certification Only	8
Certification & Degree Seeking.....	8
Application Process.....	9
Enrollment Process	9
Tuition Payments	9
Industry Certification Exam Payments.....	10
Laptop	10
Credit Award Letters	11
Certifications Program	11
Application Process.....	12
Enrollment Process	12
Tuition Payments	12
Certification Exam Payments	13
Custom Program	13
Application Process.....	14
Enrollment Process	14
Tuition Payments	14
Certification Payments.....	15
Traditional Program	15
Application Process.....	15
Certification Payments.....	15
Training Event Program	16
Application Process.....	16
Enrollment Process	16
Tuition Payments	16
Participant Data	17

Purchasing & Procurement	17
Sustainability	18
Performance Outcomes	22
Program Success	22
Major Challenges	22
Inefficient Purchasing Policies	22
Poor Institutional Student Advisement	22
Data Collecting Requirements	23
Critical Elements	23
Connected Staff.....	23
Partnerships	23
Data Collection	24
Lessons Learned	24
Institutional Barriers	24
External Review.....	25
Appendix	26
Student DOL Release Form	26
Laptop Pick up Receipt.....	27
Laptop Return Receipt – Lift Hold.....	28
Flexible Information Technology Degree.....	29
Cloud Computing Option	32
Mobile Computing Development Option	33
Web Development Option	34
Information Technology Option.....	34
CEER Employment Evaluation.....	36
CEER Student & Faculty Surveys	44
Example Training Event Survey.....	56

Introduction

Wavebreak is Tulsa Community College's answer to Information Technology's education latency challenges. Due to the nature of the technology adoption lifecycle, technology education is all too often unable to keep up with its constant evolution, leaving relevant instruction stranded on the beach, while new waves of technology are constantly emerging. The Wavebreak Program brings to the future and current IT workforce an introduction to new technologies as they surface, allowing them to be more competitive in a rapidly evolving job market.

The education provided via Wavebreak will result in college credit where applicable, as its design is focused on placing people on their desired career pathway, whether it is being introduced to emerging and evolving technologies, acquiring a degree while retaining proficiency in the IT workforce, or simply for self-improvement purposes. We believe that continual training is the key for future success in such an ever-changing industry. Those who work in Information Technology are the keepers of vital knowledge, but this knowledge can quickly become outdated. This is why Wavebreak continues to develop an extensive catalog of evolving technology-specific content and innovative learning tools to help workers reinforce and sustain their expertise, allowing them to successfully compete in today's economy.

Wavebreak's mission has been defined as:

*"To create an **Education Development & Delivery Model** that offers **Relevant & Timely Training in Evolving IT Technologies** to **Incumbent Workers**, allowing them to **Retain Technical Proficiency** while seeking a degree and **enabling its Repackaging** for College & K-12 Students." Based on this mission statement, several products have been designed and/or created to facilitate the model.*

Promising approaches and innovative processes developed through this grant included developing new/innovative methods for service delivery, establishing important strategic alliances, securing additional resources to extend project reach, and developing avenues for sustainability.

It is important to note that this program was created within a Higher Education institution. Therefore, the content herein will relate specifically to the challenges that may occur in this environment.

Purpose of the Grant Program

Grant Abstract:

The current shortage of skilled IT workers and anticipated baby-boomer retirements of IT personnel are already having a significantly negative impact on the local and regional economy overall. As a result, organizations are already looking to the global economy to fill the gaps. This creates a new dilemma for the country – organizations (global, country, regional, and local) will struggle with meeting the regulatory and security requirements that continue to place increased demand for services on U.S. organizations. Companies will be reluctant to move these types of job functions to off-shore organizations.

Moreover, Tulsa area companies say they compete for each other's qualified workers because there is no skilled information technology local labor pool in which to choose from. This barrier is not isolated to Tulsa. The nation is experiencing lateral movements in the industry, attributable to lack of IT skills sets rather than decreased demand.

When factoring in local projected baby boomer retirements coupled with increased demand in response to evolving changes in information security, the consequence for a local Tulsa regional economy without a qualified workforce is severe. These alarming facts lend to a major regional and global economic impact as companies struggle to address their ever-growing needs for technology staff. If a replicable solution is not constructed, shortages will occur and result in a loss of development, a slowing down of new product development, a loss of revenue, and a general slowing down of the all the worlds' economies.

Through talks with local employer partners, GCWED and WIB staff, and significant research by TCC faculty and workforce development officials, Tulsa Community College (TCC) has identified key capacity constraints that must be alleviated in order to overcome workforce challenges. Regional Information Technology Development Initiative (RITDI) is part of a strategic plan to support growth of a dynamic local, state, regional and global information technology industry. The project aims to unite more employers, educators, and workforce partners in order to establish a viable information technology industry career pathway; increase the local information technology labor pool; increase TCC's capacity to meet industry workforce needs and align with clearly identified career pathways; increase public awareness of information technology career pathway opportunities through secondary school outreach, job fairs, and an enhanced outreach plan with partner commitments; and train approximately 200 incumbent and adult/dislocated workers for work in the IT industry, which will impact more than 10,000 individuals over the next three years, including K-12 disadvantaged youth.

Program Training Options

The Wavebreak programs that have been created under this project are: Cohorts, Certifications, Customs, Traditional, and Training Events. Each program type allows for a different form of content delivery to a wide group of students, from traditional college students to professionals looking to update their skillsets.

Cohorts Program

Wavebreak Cohorts are comprised of a series of courses which award the student with a certification from the training institution, or an Associates of Applied Science degree using the same series of courses coupled with general education requirements required by the State Regents.

Each series of courses is referred to as a Cohort Pathway. For example, at the time of this document, Wavebreak offered three Pathways in the Cohort model. They were Web Application Development, Mobile Application Development, and Cloud Computing.

Students have the ability to join a Cohort related to one of the three Pathways identified. Using the Cohort model, Wavebreak is able to offer students the ability to complete the entire degree or certification program within one year as it relates to the college semester model (including summer semesters). Students that are unable to complete the course work within one year are able to complete the pathway's curriculum, though under the guidelines offered by the Traditional program, outlined later in this section.

The purpose of the Cohort model is to provide a method of instruction that not only offers the student a comprehensive training program, but also gives the program a customizable structure that fits within constraints setup by governing bodies in higher education. The overall focus of the Cohort is to be proactive in the quest for relevant Information Technology education, rather than the usual stance of being reactionary, mostly due to the struggles that accompany the constraints in higher education. This model relies heavily on the Flexible Information Technology degree described later in this document.

Certification Only

Cohort students that choose to only take the series of courses that are specifically related to the Pathway, in which they have been accepted, will earn a Certification from the training institution. No other courses will be funded under Wavebreak.

Certification & Degree Seeking

Adding to a Cohort's series of courses, which once complete, award the student with a Certification, the student may also choose to complete general education requirements that award them with an Associate of Applied Science degree, specifically the Flexible Information Technology degree (*see: Flexible Information Technology Degree*). This is a degree program that offers an institution's Information Technology faculty a flexible method to create and deliver timely and relevant course materials in a rapidly-changing technological environment.

If a student is seeking the Associate of Applied Science degree under their chosen Cohort and they have prior college credit that can be awarded toward this degree program, then they may submit an Official Transcript for evaluation. Because the Cohort, requires classes to be taken in an order mandated by the program, these transcripts should be submitted as soon as possible to alleviate the possibility of the student having to take a course in which they already have credit.

Application Process

To apply to a Cohort, a student must submit for review the following:

- **Resume -**
This helps to determine a student's aptitude for success in the program based on their previous education or their employment.
- **Cover Letter -**
This helps to determine a student's desire for the program with a detailing of how it may be able to enhance their career opportunities.
- **Transcripts -**
This is a validation of the student's previous education, as it relates to information that has, or has not, been included in the resume.
- **Other -**
Other items may be necessary depending on the requirement from the awarded grant or institutional policies.

Once accepted as a participant, a student must:

- apply and be accepted to the training institution
- submit a Free Application for Federal Student Aid (FAFSA), if necessary
- sign and return the Student Release Form

Enrollment Process

Because this is a Cohort model (where all students take each class in the program together in a regiment), to ensure students have access to the correct classes at the necessary times, Wavebreak handles the enrollment process for all students; therefore students should not enroll themselves into any classes under this program via any method that may be available to them. They may of course, enroll into any other classes at the college as desired, though Wavebreak will not pay for any part of those classes unless agreed upon, in writing, prior to the enrollment.

Tuition Payments

This section refers to the payment options available to Tulsa Community College during the time they had access to Community-Based Job Training grant monies awarded by the U.S. Department of Labor's Education & Training Administration.

Due to a student's acceptance to the Wavebreak Cohort program, they qualify for tuition assistance of up to 100%. In order to accept the funds offered, the student must complete a Free Application for Federal Student Aid (FAFSA), which qualifies the student for gap funding provided by the U.S. Department of Labor's CBJT grant. Gap funding is money awarded to a

student above the amount awarded by the Pell Grant (which is qualified by the FAFSA). Any charges that the Pell Grant does not cover are then provided via the DOL CBJT grant awarded to Tulsa Community College in 2008.

Under the guidelines above, Wavebreak will pay:

Tuition and Fees:	100%
Laptop Computer:	100%
iPod Touch (<i>Mobile Application Pathway Only</i>):	100%
Certification Exams (<i>if applicable to program</i>):	100%
Books & Supplies:	0%

In order for a student to continue under the “funded” student status, they must complete each class that the Wavebreak program funds according to Tulsa Community College’s academic standards. If any class during a term is not successfully completed to these standards, funding through Wavebreak will no longer be available to that student for future classes. A student will however still be able to complete the program if they are able to find other sources of payment. Withdrawing from or Dropping a class results in an unsuccessful completion.

Industry Certification Exam Payments

Under the Cohort program, if any industry recognized certification exams are available due to the content provided by a course in a student’s Pathway, then Wavebreak will issue a voucher to the student for them to take the certification exam at their leisure. Taking certification exams is not mandatory and completely up to the student to request the voucher if they choose. A voucher will only be given to a student one time for each qualifying exam. If the exam is failed, the exam will need to be re-taken at the student’s expense, if the student desires to do so.

Laptop

Student’s that are in a Cohort will be issued a Laptop computer. The computer’s specifications will be determined by Wavebreak.

If a student does not successfully pass a Wavebreak funded class to the institution’s academic standards, then Wavebreak will be unable to continue funding that student’s completion of the Wavebreak Cohort program. Because of this, the student will not be able to finish the Cohort under a funded status and therefore the issued laptop will need to be returned. If the laptop is not returned by the start of the next semester, Wavebreak will impose a Hold on the student’s institution account that will hinder them from enrolling in any future courses, under Wavebreak or not, as well as hinder them from having access to their transcripts.

The student may still return the laptop in proper working condition, as is stated to the student in the agreement signed when picking up the computer (*see: Laptop Pick up Receipt*). At this time, the Hold will be lifted by the bursar via a receipt Wavebreak will issue to the student (*see: Laptop Return Receipt – Lift Hold*).

However, if the student does successfully complete the program, they are entitled to keep the laptop computer as their own.

Credit Award Letters

Wavebreak will evaluate resume's and transcripts to determine if a student should receive credit for any course in their Pathway without having to take the course, as well as any "Apprenticeship" credit they may have earned through prior work history (which is only applicable to the Degree option). Once these evaluations are completed, Wavebreak will issue a letter to the institution's Enrollment Services requesting that the student's official transcript be credited for the evaluated course.

Certifications Program

Certification classes are programs built around an industry recognized certification exam, such as those from Microsoft, ITIL, Comp TIA, Cisco, etc.

The purpose of the Certification model is to prepare a student for an industry exam, allowing them to gain a useful credential to add to their resume in a relatively short time frame. There is no question that computer certifications will improve the job prospects for any individual. As they learn about the latest technologies, they will also be doing a lot to improve their odds of working as an Information Technology professional.

Information Technology certifications provide a globally recognized way of establishing the qualifications of technology professionals. They offer solid proof that potential employees are capable of performing the tasks that they will be assigned and will not require a lot of training in order to do their jobs. Certifications are viewed so highly by some companies that they hesitate to even consider employing those without them.

The reason that Wavebreak has considered these certifications to be an enhancement to the degree options is due to the fact that each year more and more graduates are leaving college with a technology-related degree. This is the reason that it is extremely important for individuals to stand out from the crowd, and Information Technology certifications are the most constructive way to do that.

Because it is the rare individual that would be able to sit for a certification exam and pass without taking the time to fit in a significant amount of study time, studying will be required before taking the exam. There are a few options for acquiring the knowledge required to pass a certification exam.

1. Preparatory courses are available both on ground and online for most certifications. Many are offered by vendors, but some many are offered by colleges as well. The Wavebreak program not only offers these courses, but also gives 3 hours of college credit toward the course as well.

2. Boot camps are offered as well, where students learn via an accelerated training session. In a short amount of time, participants will, ideally, learn all that they need to know in order to successfully pass their certification exam. This option works well for those who do not have the time to take an 8 week course within a college's schedule.
3. Independent-study is an ideal option for those with enough discipline to work on their own. They need only purchase books and study guides in order to obtain the knowledge that they require. Some vendors even offer books and kits specifically designed to prepare people to take their certification exams.

Application Process

Certification programs are first and foremost offered to instructor recommended students. Other students may apply if room is available. Applicants not recommended by instructors are to submit a resume and cover letter detailing their experience as it relates to the certification they plan to obtain.

Enrollment Process

To ensure that only applicable students have access to the certification classes, Wavebreak handles the enrollment process for all students; therefore students should not enroll themselves into any classes under this program. They may of course, enroll into any other classes at the college as desired, though Wavebreak will not pay for any part of those classes unless agreed upon, in writing, prior to the enrollment.

Tuition Payments

This section refers to the payment options available to Tulsa Community College during the time they had access to Community-Based Job Training grant monies awarded by the U.S. Department of Labor's Education & Training Administration.

Due to a student's acceptance to the Wavebreak program, they qualify for tuition assistance of up to 100%. In order to accept the funds offered, the student must complete a Free Application for Federal Student Aid (FAFSA), which qualifies the student for gap funding provided by the U.S. Department of Labor's CBJT grant. Gap funding is money awarded to a student above the amount awarded by the Pell Grant (which is qualified by the FAFSA). Any charges that the Pell Grant does not cover are then provided via the DOL CBJT grant awarded to Tulsa Community College in 2008.

Under the guidelines above, Wavebreak will pay:

Tuition and Fees:	100%
Certification Exams <i>(if applicable to program)</i> :	100%
Books & Supplies:	0%

In order for a student to be offered another certification class under the "funded" student status, and after the 90 day exit period, they must complete the class that the Wavebreak

program funds according to Tulsa Community College's academic standards. If any class is not successfully completed to these standards, funding through Wavebreak will no longer be available to that student. A student will however still be able to join another class if they are able to find other sources of payment.

Certification Exam Payments

Under the Certification program, Wavebreak will issue a voucher to the student for them to take the certification exam related to the successfully completed class. This exam may be taken at the student's leisure. Taking certification exams is not mandatory and completely up to the student to request the voucher if they choose. A voucher will only be given to a student one time for each qualifying exam. If the exam is failed, the exam will need to be re-taken at the student's expense, if the student desires to do so.

Custom Program

Custom programs are built specifically by request of an Industry partner to the grant or those partners who have become associated because of the grant's activities.

The purpose of the Custom model is to service a specific need of a company, for example one that may use a particular technology not utilized in other companies in the area. Of course, several companies may come together looking for a specific training opportunity which may create a foundation for them to work together on an upcoming project between the two.

As businesses strive to stay competitive in a global marketplace, they must adjust their talent management strategies accordingly, including how they approach training. Employers will begin to identify opportunities for employees to learn more, and be more proactive, about their continuing education in the Information Technology field. In addition, an increasing number of employers will encourage "attitudinal shifts" in how employees view training and development, so they can embrace lifelong learning, acquire new skills as business and client needs change, and carve out time in their schedules for training.

Over the next decade, training needs to become easily adaptable to address the changing needs of the business or its clients. Trainers will need to identify and develop training that is adaptable, can be changed on the spot, and can be changed easily. This is often a difficult area for college faculty in that they provide training, and are paid for that training, in ways that are completely different from the methods listed above.

Wavebreak works with these partners to increase access to these training opportunities, though having a grant to facilitate the cost of these programs has been, and will be, a requirement.

Application Process

Because these programs are specific to an Industry requirement/request, the student's that are able to participate are those who are recommended by the partner. Other students may apply if the partner allows and there is room available. Applicants not recommended by the partner are to submit a resume and cover letter detailing their experience as it relates to the program in which they are applying.

Enrollment Process

To ensure that only applicable students have access to the custom program class(s), Wavebreak handles the enrollment process for all students; therefore students should not enroll themselves into any classes under this program. They may of course, enroll into any other classes at the college as desired, though Wavebreak will not pay for any part of those classes unless agreed upon, in writing, prior to the enrollment.

Tuition Payments

This section refers to the payment options available to Tulsa Community College during the time they had access to Community-Based Job Training grant monies awarded by the U.S.

Department of Labor's Education & Training Administration.

Due to a student's acceptance to the Wavebreak program, they qualify for tuition assistance of up to 100%. In order to accept the funds offered, the student must complete a Free Application for Federal Student Aid (FAFSA), which qualifies the student for gap funding provided by the U.S. Department of Labor's CBJT grant. Gap funding is money awarded to a student above the amount awarded by the Pell Grant (which is qualified by the FAFSA). Any charges that the Pell Grant does not cover are then provided via the DOL CBJT grant awarded to Tulsa Community College in 2008.

Under the guidelines above, Wavebreak will pay:

Tuition and Fees:	100%
Certification Exams <i>(if applicable to program)</i> :	100%
Books & Supplies:	100%

In order for a student to be offered another certification class under the "funded" student status, and after the 90 day exit period, they must complete the class that the Wavebreak program funds according to Tulsa Community College's academic standards. If any class is not successfully completed to these standards, funding through Wavebreak will no longer be available to that student. A student will however still be able join another class if they are able to find other sources of payment.

Only students that are recommended through an Industry relationship can extend the definition of their program to include other class options, such as a Cohort or Certification.

Certification Payments

Under the Custom program, Wavebreak will issue a voucher to the students for them to take any certification exam related specifically to the successfully completed class (as requested by the Industry partner). This exam may be taken at the student's leisure. Taking certification exams is not mandatory and completely up to the student to request the voucher if they choose. A voucher will only be given to a student one time for each qualifying exam. If the exam is failed, the exam will need to be re-taken at the student's expense, if the student desires to do so.

Traditional Program

This is a degree program that offers an institution's Information Technology faculty a flexible method to create and deliver timely and relevant course materials in a rapidly-changing technological environment. This is the same degree program offered within the Cohorts, however the courses a student chooses to complete are flexible as they do not follow a pathway defined by Wavebreak. In other words, the Traditional program model represents the general Information Technology option under the Flexible Information Technology degree (*see: Flexible Information Technology Degree*).

The purpose of the Traditional model is to allow a student an option to complete their Associates of Applied Science degree towards the Flexible Information Technology program in the traditional timeframe usually associated with an Associate's degree, 2 years.

Application Process

To apply to a Traditional program as a participant of the grant, a student must submit for review the following:

- Transcripts

Once accepted as a grant participant, a student must:

- apply and be accepted to Tulsa Community College
- sign and return the Student DOL Release Form

A student in the Traditional program is not able to receive funding for any classes associated with their degree.

Certification Payments

Under the Traditional program, if any industry recognized certification exams are available due to the content provided as one of the courses in a student's pathway, then Wavebreak will issue a voucher to the student for them to take the certification exam at their leisure. Taking certification exams is not mandatory and completely up to the student to request the voucher if they choose. A voucher will only be given to a student one time for each qualifying exam. If the

exam is failed, the exam will need to be re-taken at the student's expense, if the student desires to do so.

Training Event Program

The Training Event program is an intensive training in Information Technology related topics where specialists and others can attend training "boot camps." The advantages to this kind of event is that the training is shorter than other types of training; more drills and repetition are involved and the program is rigorous, intensive and challenging.

These events are a very important part of the outreach activities as they are designed to increase awareness and help change the perception of the institution in the community as being a significant provider of cutting edge technology training. In other words, often times a higher education institution is perceived by most of the community to be a place where the IT training offered is dated and insignificant to emerging technologies and employment growth opportunities. Therefore, these outreach opportunities are not specifically related to increasing employment, but more so offering bits of training to validate the institution's programs as well as allows the attendees to use the content for building "full on" training opportunities through the college using the Wavebreak model.

These events may be offered by the faculty or be outsourced from industry professionals.

Application Process

To apply to a Training Event program, a student must submit by simply signing up for the event.

Enrollment Process

To ensure that only students who have signed up through the Wavebreak program have access to the event, Wavebreak handles the enrollment process for all students.

Tuition Payments

This section refers to the payment options available to Tulsa Community College during the time they had access to Community-Based Job Training grant monies awarded by the U.S. Department of Labor's Education & Training Administration.

There are several ways that this type of event can be paid for by the student. Because this is an outreach program, the events have usually been paid for by the grant and offered to the attendees for free or some arbitrary amount, usually resulting in a loss. The event can also be packaged as a "Retreat" in rural areas where students will need to have lodging & meals provided.

Participant Data

As students enter the program, data is collected for the following items:

- Name
- Student ID
- Social Security Number
- DD-214, *if applicable*
- Selective Service status, *if applicable*
- Work History
- Education

Of all the items collected from the student, no data is used for anything other than what is required for Wavebreak to properly report participant information to the USDOL/ETA, or what would be required to help the student gain employment. No data collected by the program is shared with any other department within the institution unless authorized by the participant.

Data collection is a necessary component of any program: without data, no analysis can be completed, manuscripts published, or policies supported. Implementation of quality data collection methods can lead to a better experience for participants, easier management for staff, and more valid conclusions being drawn by the institution or other stake holders.

Purchasing & Procurement

The Wavebreak program uses Tulsa Community College's procurement policies to purchase all goods, services, and travel requirements. Each institution should use their institution's requirements as well; however understand that a program of this nature may require some purchases that are not common to the institution, making the process for procurement slow and inefficient. Therefore, be sure to understand the nature of the institution's policies and gain the necessary approval from those within the institution who can direct change to policies if it is deemed necessary to do so in order accomplish program tasks.

Sustainability

The term “Sustainability” refers to the continuation of a project’s goals, principles, and efforts to achieve its desired outcomes. It is important to not make the mistake in thinking that sustainability of this project refers to finding the resources to continue it “as is” beyond the period of grant funding, but rather to ensure that the goals of the project continue to be met through activities that are consistent with the current conditions and workforce development needs in the area.

Having a vision of sustainability for the Wavebreak program means continuing to focus on the industry’s and constituent’s view of the training offered at the institution. This is basically “big-picture” thinking to determine how the community is enriched or diminished by the institution’s Information Technology training services. Therefore, the Wavebreak Vision for sustainability is:

*“To continue to serve the community by offering **cutting edge relevant training opportunities** in Information Technology and do so **using schedules that reflect the preferences required by industry and other working adult students.**”*

Our intended results from this message is that the institution will continue to change the perception of the Community College from a latent education institution, to an institution which offers courses that are relevant to the ever changing nature of the Information Technology field. By using Advisory Committees and Industry Partnerships, the institution should be able to continually offer the most needed courses to drive the market, rather than reacting to it.

In order to accomplish this task, the institution must identify and develop champions who can assist the organization in gaining the recognition and resources needed to achieve short- and long-term goals. Once the funds are expended from the grant, it is important to be sure that the institution continually make the community aware of the opportunities they offer reminding them of the services that the institution has been able to provide and can continue to provide. Here are some steps that may be helpful in creating a sustainable strategy:

1. Identify the Vision for Sustainability
2. Conduct a Needs Assessment to Identify the Problem
3. Assess Available Resources that can Sustain the Solution
4. Select a Solution Approach/Strategy
5. Develop the Solution’s Objectives and Activities
6. Identify Potential Challenges and Develop a Contingency Plan
7. Complete the Sustainability Strategy

Identify the Vision for Sustainability

From the beginning, a statement should be created to serve as a guide within the institution and for the community. This activity provides a framework for constructing long-range goals that point in the right direction, in this case the sustainability of an ever-changing responsive training opportunity program. The institution must envision a place where Information Technology’s workforce problems and needs

are met – they are relevant, proactive, and fulfilled. Then design a plan that moves in the direction of that “perfect” place. The road to that vision may be challenging due to institutional constraints, but never-the-less the destination must be understood. Because of these challenges, the route must be clearly defined.

Conduct a Needs Assessment to Identify the Problem

A successful project that can be sustainable is one that was designed based on a good understanding of the current conditions and identifies the problems preventing the institution from achieving its goal. Conditions include aspects such as geographic location, demographics, and usually history and institutional culture. A “needs assessment” can be conducted to identify the problem(s), which have actually already been identified earlier in this document, and determine which need the sustainability should address. A “needs assessment” can also be used to gather information once a specific problem has been identified, in order to design a plan that will effectively address the problem.

Assess Available Resources

The assessment of available resources helps to determine the best strategy for creating a sustainable training program. It is true that every project and every strategy is different and requires a different set of resources, but a few hard-and-fast rules exist in the assessment of available resources. Answers to the "Who, What, Where, When, and Why" formula will determine the resources available, moving the institution closer to the "How" it will be accomplished. Who will manage the training opportunities? What opportunities need to be made available? Where will the training take place? When is the best time to offer these programs? Why should a particular program be offered?

Determine the Project Goal

The goal is a basic description of the purpose of the endeavor, in other words, the solution to the problem identified earlier. The goal should reflect the set of conditions desired by the community after the problem is addressed. The statement should be brief and to the point, as well as realistic. The goal determines the scope of what is actually sustainable, so do not state that the project will accomplish more than it possibly can. It is sometimes difficult to distinguish between goals, objectives, and activities. However, the information in the next steps will help to clarify these three components.

Select a Project Approach/Strategy

Once you have determined what is actually sustainable from the program in place, the strategy can be developed. Based on the information gathered in the previous steps, develop a list of possible strategies for addressing the problem and achieving the goal and then select a strategy that represents the best method for implementation. This strategy will be the basis for developing the objectives and activities. Very few rules exist for ultimately selecting the most promising approach in terms of both the problem to be solved and the opportunity to secure funding and other resources, mostly because the proper approach will be unique to each community. In selecting the most promising approach for solving the

problem identified by the institution, as well as the community they serve, and achieving the goal of sustainability, consider the following issues:

- Use experience with past similar programs ideas and/or program - what strategy worked then?
- Research similar projects, such as this one, and build off of them. Use their best practices to guide selecting an approach.
- Ensure the approach is in line with the resources available, as they are probably different from others successful operations.
- Design the strategy so that its activities, tasks, and phases build incrementally to establish a clear path for achieving the goal.

Develop Project Objectives and Activities

Once it has been determined how implementation will commence, it is time to begin developing objectives. Objectives are specific, measurable accomplishments designed to address the stated problems and attain the goal. An objective is an endpoint, not a process, to be achieved within a proposed timeframe. Completion of objectives must result in specific, measurable outcomes that benefit the community being served and directly contribute to the achievement of the stated goal, and ultimately the sustainable objects. Both the community and the institution want a clear picture of what will be accomplished by the sustainable objects of the training program. Though there may be only one goal, there can be several objectives to achieve that goal.

Once the objectives have been developed, activities are written to provide a logical sequence of measurable milestones. Each objective should be broken down into activities that will be performed in a logical progression, in a satisfactory time frame, and with the resources available. Activities describe the major tasks to be completed for each objective, but not every day work tasks.

Identify Potential Challenges and Develop a Contingency Plan

By developing a contingency plan the institution is better prepared for challenges. By planning ahead for a potential barrier, the chance is more likely that it will be handled with minimal disruption and cost. The contingency plan should be reviewed by all those who will be a part of the training function after the funds have expired. The first step in preparing a contingency plan is to develop a list of possible risks and assumptions. When working out the details of a project strategy, factor in any risks one might face due to assumptions made regarding timing of project activities, partnerships, leveraged resources, internal requirements, etc. In a higher education institution, tasks such as being able to attract and maintain qualified staff, securing key project materials and completing tasks in a designated time frame are examples of those assumptions. For instance, a partner who has pledged a facility for a training event suddenly determines the facility will not be available to provide services.

Complete the Sustainability Strategy

A sustainable project is one that will continue after the initial startup funds have been depleted and will continue to successfully contribute to the community. Sustainability involves outlining a specific strategy

and action plan for continuing the project. The first question usually asked, as it relates to sustainability, is about future funding. As the initial funds are being used, it is important to think about how the money spent can be money returned and used during the post grant period. The Wavebreak program has used the program income function to create an income stream from students attending workshops that are paid for by the grant. The amount these students pay is minimal, though it has added up to allow for continuing the service beyond the grant funds.

Of course, the resources created during the grant, sometimes referred to as "grant products", will allow for sustainability as well. This would include the curriculum created, equipment purchased, etc.

Performance Outcomes

Program Success

In order to reach the project goals, there have been many accomplishments. These include completing capacity building and outreach activities, completing work on product deliverables, and achieving better than expected training outcomes. Due to these accomplishments, the institution has benefited from Wavebreak in ways that were not originally anticipated. Some accomplishments have been:

- Several Wavebreak students in the Mobile Application Development Certificate program submitted their programs to the iTunes App Store and gained approval. They are currently on the store selling for \$.99 to \$2.99.
- Wavebreak has enrolled 331 students as of the date of this document. This is 131 more students than was originally expected and required by the grant.
- Wavebreak has received such recognition that other institutions are looking to the program for guidance in starting their own model that reflects Wavebreak.

Major Challenges

As for challenges, the grant process was fairly new to the institution when it was executed, not to mention that Wavebreak was the first Department of Labor grant that institution had been awarded. Because of this, the major challenges that were encountered during the grant period were related to procurement and process. These included:

Inefficient Purchasing Policies

During the execution of the Wavebreak program, the institution was going through changes in upper management, especially related to the financial office. This caused for policies to have different interpretations in what seemed to be on a weekly basis. Another factor was that the system for purchasing and procurement was in the process of implementation, leaving many without the knowledge on how to accomplish the tasks we requested on them. Both of these factors caused many challenges related to purchasing trainers, curriculum development, contractual needs, etc. A lesson from this experience was to be well informed of issues surrounding the program that could cause for roadblocks throughout the implementation of the program.

Poor Institutional Student Advisement

Several changes to the initial plan needed to be made in order to accommodate different situations that occurred once classes began for the first group of students. By focusing on tactics used by startup business for example, the direction for executing the deliverables was easy to change from day to day. At this time, a few students were unable to complete the training either

because they took it upon themselves to drop the program, mostly due to the course work being too rigorous for their current circumstances, or due to poor advisement within the institution.

It is very important that institutional academic advisors and counselors are 100% familiar with the program, or at least know to direct the student to your office for the proper advisement. This is because it is likely that the training provided under this program is done so in a manner unlike the usual training offered at the institution. This can cause for many miscommunications between students and the institution. Plan to provide academic advisement to students yourself.

Data Collecting Requirements

Challenges have occurred concerning student enrollment. As a Workforce grant, students want the path of least resistance when it comes to enrolling in the classes. The program was designed to make the student complete quite a few steps in order to become a participant, let alone to complete the enrollment process. Of course, each of these steps has a purpose and is simply required to be sure the awarded funds are used to create and sustain the best training options available. Therefore, tasks for retrieving data should be an easy process with a few guidelines to help be sure the process is quick and well thought out. This could mean that it is best to be sure that students are notified of classes as quick as possible, ensuring their ability to accomplish all tasks and enter into the program quickly, keeping their paperwork organized and controlled for better preparedness for their continued training.

Critical Elements

In order for the program to be a success, it has been determined that:

Connected Staff

The institution must be able to self-market the program internally. To best promote the program's success within an institution, internal marketing efforts should be securely in place while being sure that the proper people are delivering the message. Having TCC personnel on the grant team has provided the necessary "insider" access to the culture, policies, and functions of the institution itself. If possible, find a leveraged position to be filled with a forward thinking veteran of the institution.

Partnerships

This grant's success will have a great deal to do with the partnerships that are created and sustained. It is important to engage partners early on in the grant to build relationships, though not particularly to gain much information that guides creating that grant's overall plan. We've learned that engaging the partners later in this lifecycle allows for a focused conversation related to the training actually required.

Data Collection

Not to be redundant, though the collection of, and entry of, good data is a key to the success of the program, whether funds come from internally or by a third party. In some cases, our program did not attempt to collect all the student data until after the classes had begun. This caused for having to contact the students several times to be sure all data was collected. It is important to acquire the necessary documentation during the service to ensure the data is collected in a reasonable timeframe and in total.

Lessons Learned

Institutional Barriers

Institutional barriers have been at the heart of all issues that have confronted this grant opportunity. There is a reality of sorts that is forced against the course of events put in motion once a grant is awarded. Grants are written with the best intentions in mind, but often set a course that contradicts with policies in place within the institution for which the grant has been awarded. This causes several setbacks due to “picking battles”, tension between faculty and administration, etc.

Creativity, as it relates to institutional barriers, becomes the number one lesson learned. Even with many barriers, the grant’s deliverables must be met and on a timely schedule. That timely schedule may not follow the timeline laid out in the grant word for word, but due to the course of actions, will be the necessary schedule to complete the tasks and provide for a sustainable outcome.

External Review

In order to achieve an overall evaluation of the successes of the program, the Center for Educational Evaluation and Research (CEER) has served as an external evaluator. CEER has over 10 years' experience in evaluation and has worked closely with project staff to design formative and summative evaluation measures to measure capacity building outcomes, and assist to the Project Director when measuring training outcomes. CEER has used formative evaluation activities to provide information to project staff to facilitate ongoing refinement of processes and methods. Summative evaluation measures success of achieving specific project outcomes. Both methods have measured increases in collaborations between industry and education and increases in awareness of and interest in IT careers and educational pathways. Both quantitative and qualitative methods, including focus groups, surveys, and semi-structured interviews have also been used.

CEER Employment Evaluation

[CEER Student & Faculty Surveys](#)

Appendix

Student DOL Release Form

Office of Admissions & Records
Tulsa Community College

Student Information Release Form

Permission to Release Education Record Information for CBJT Grant funding

Requested By (Student):	Release To (Recipient):
Student Name _____	U.S. Department of Labor
Student CWID and SSN _____	

Education record information to be released:

1. Enrollment in training program (including training beginning and end dates);
2. Completion of training (including training completion or withdrawal);
3. Attainment of an industry/professional certification as a result of training (including
4. Employment Status Prior to training;
5. Employment Attainment at exit/completion of training;
6. Attainment of promotion after completion of training;
7. Employment during training that received a wage increase in first, second, or third quarter after completing training;
8. Change of Employment as the result of training;
9. Unemployment and wage related data;
10. Gender;
11. Ethnicity;
12. Race;
13. Disability Status;
14. Veteran Status;
15. Site Location;
16. Program;
17. Educational Goals;
18. FAFSA (financial aid application) data as needed;
19. Social Security Number (used to capture employment data and award financial aid);
20. Birth date;
21. Permanent and Local Addresses;
22. Phone Number and E-Mail Address; and
23. Income and Household composition.

Purpose of release:

Fulfillment of state and federal reporting requirements for CBJT grant issued to students through Tulsa Community College.

I give permission for Tulsa Community College to release the specified information to the recipient(s) listed above. I understand that this information is considered part of a student education, financial, and/or housing record. Further, I understand that by signing this release, I am waiving my right to keep this information confidential under the Family Education Rights and Privacy Act (FERPA). I certify that my consent for disclosure of this information is entirely voluntary. I understand this consent for disclosure of information can be revoked by me in writing at any time, but will not affect the information released under my previous consent. If I wish to make any changes to my consent for release, I understand I will need to complete and file a new form.

Student Signature _____ Date _____

OFFICE USE ONLY				
Action taken	Completed	Filed	Filed	Other
DATE	BY WHOM			

Laptop Pick up Receipt



Laptop Receipt

(Student and ID)
Cloud Computing Program (C-CLD)

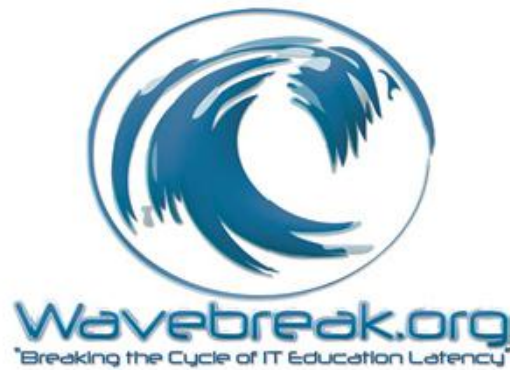
I affirm that I have received the (manufacturer) computer with serial number (_____) from Tulsa Community College's Wavebreak Program. I understand that this computer is to remain in my possession for as long as I am in the Wavebreak Program and upon my successful completion of the Wavebreak Program. If I, at any time, fail to complete the program to the provisions given to me upon my entry into the program, then I must return the computer in proper working condition to the Wavebreak program office at the Northeast Campus.

WB Initials

Student Signature

Date

Laptop Return Receipt – Lift Hold



TCC Account Hold for Wavebreak Laptop

This receipt indicates that: _____
has returned to the Wavebreak office, the laptop computer _____ responsible for the BU Hold on their
TCC account.

Please lift the related Hold from _____ TCC account to allow for future class enrollments as well
as access to official transcripts.

Wavebreak Official

Date

Flexible Information Technology Degree

Introduction

Information Technology is the study, design, development, implementation, support or management of computer based information systems, particularly software applications and computer hardware. Jobs in the IT field are varied, complex and specialized as are the knowledge, skills and experience required to perform them. Therefore, students will have an array of education and training to serve different purposes. Among those are programs which will prepare students for jobs in programming or networking. Others will train in areas such as IT security and data mining. Graduates will develop careers as Network Installers, Software Engineers or Database designers to name a few.

The Flexible Information Technology Degree program provides students with the skills needed to work in today's rapidly changing Information Technology environment. The program is designed to offer students two different pathway options for achieving a degree in this area. One option is to help guide the student into a focused area of Information Technology such as, Mobile Application Development, Web Application Development, or Cloud Computing. The other track is to allow the student to create their own focus, by selecting a general Information Technology option, which would be the most flexible offering under the degree plan.

It is not only important to offer such a flexible option as a benefit to the students. One of the most important aspects to this idea is the benefits to faculty, in that it allows for them to easily update content and acquire training in new fields without being subject to institutional barriers that may cause an upgrade of these materials to be more work than it is worth.

Further information relating to the purpose of this degree plan can be explained via the "Wavebreak: Breaking the Cycle" presentation.



Benefits of the Degree

The purpose of this specific degree plan is to award a student with an Associate in Applied Science degree. This new option in Information Technology is part of a broad effort through which any academic department can be able to offer their own flexible degree programs. Undergraduate students who pursue these flexible majors will receive a more interdisciplinary education, but one that still features the rigor and technical depth of the school's traditional degrees.

The flexible degree program addresses a student's interest in tackling problems within their businesses, homes, communities, and globally. This program allows students to pursue topics that are inherently interdisciplinary — like Mobile Development and Cloud Computing — in greater depth. In addition, the option is intended to lower perceived barriers between Information Technology and other fields.

This degree is structured around a core set of subjects offered by the Information Technology department. Students then complement that core with a concentration area comprised of different subjects drawn from across other fields from within the Information Technology discipline.

This new degree program is an explicit recognition of the need for Information Technology education that goes beyond narrow disciplines. For example: Cloud Computing. This is a topic that is not uniquely about traditional networking, but rather it encompasses areas of security, connectivity, programming, systems, etc. Students need to have an understanding in all of these areas to make progress in the field.

From the school's perspective, the program should offer an opportunity to coordinate subject offerings across departments, which will help to identify holes and eliminate redundancies in the curriculum. Mostly however, it will offer the ability for faculty to attempt new course offerings without jeopardizing a student's possibility for a timely graduation. Thinking of these options as "cartridges" that plug into the degree plan, when a "cartridge", such as Web Application Development, no longer enrolls a significant number of students, then it can be replaced quickly with another option that does, yet still under the same degree offering.

Structure of the Degree

As mentioned above, the student should have two options when choosing this degree. One option is to help guide the student into a focused area of Information Technology that is pre-defined as a “cartridge” described above. Some current “cartridges” one could consider are Mobile Application Development, Web Application Development, and Cloud Computing. The other option is to allow the student to create their own focus, by selecting a general Information Technology option. With this option, the student could, in theory, create their own Mobile Application Development track, though the student also can optionally take courses that are not pre-defined. This allows for the student to choose from “Special Topics” courses that faculty may offer in order to test a course’s validity before placing it in the institution’s catalog. These courses would still be considered towards the student’s degree plan under this structure. Therefore, the options for this example are:

- Cloud Computing
- Mobile Application Development
- Web Application Development
- *General* Information Technology

Each section below is broken down by the credit hour sections necessary to complete the 60 hours needed toward an Associate’s Degree.

General Education Requirements *mandatory by state law (Oklahoma) - Credit Hours: 18*

English (6 hours)

- Composition I
*and select **one** course from the following:*
- Composition II
- Technical/Professional Writing
- Business Communication I

Mathematics (3 hours)

- College Algebra
- Business Mathematics

Social Science (6 hours)

- American Federal Government
and select one course from the following:
- U.S. History 1492 to Civil War Era
- U.S. History Civil War Era to Present

Speech (3 hours)

- Speech Communication I
- Interpersonal Communication

Standard Discipline Course Requirements (Core) - Credit Hours: 15

Business (3 hours)

- Introduction to Business
- Principles of Management

Core Computer Information Systems (12 hours)

- Computer Concepts and Applications
- XHTML
- Network Fundamentals
- Introduction to Computer Programming

Specialty Course Requirements - Credit Hours: 27

Select from one of the following three degree options for the remaining hour requirements:

Cloud Computing Option

Recommended courses:

- Introduction to Unix
- Microsoft Windows Server
- ITIL Foundations
- Broadband Networking/CCENT
- CCNA Routing and Switching
- Cloud Computing
- 9 hours of any other Computer Information Systems courses

Cloud computing is Web-based processing, whereby shared resources, software, and information are provided to computers and other devices (such as smartphones) on demand over the Internet.

Cloud computing is a natural evolution of the widespread adoption of virtualization, Service-oriented architecture and utility computing. Details are abstracted from consumers, who no longer have need for expertise in, or control over, the technology infrastructure "in the cloud"

that supports them. Cloud computing describes a new supplement, consumption, and delivery model for IT services based on the Internet, and it typically involves over-the-Internet provision of dynamically scalable and often virtualized resources.

Student Flexibility:

This program specifically focuses on the networking basics that a person in this field should understand, but also emphasizes the “Cloud element of the topic in areas such as virtualization, software-as-a-service (SaaS) deployment. However, the idea for this option is to allow the student to take courses related to specific areas of Cloud Networking in which they are interested in, such as security, information assurance, hardware, etc.

Faculty Flexibility:

Trends in Cloud Computing are constantly metamorphosing as individuals and companies begin to form this new approach to computing. It is important that a faculty member is able to concentrate on the fundamentals of the “Cloud” and not the specific technologies currently in this space. These fundamentals focus specifically on the Cloud’s ability to be secure, available, and reliable.

Mobile Computing Development Option

Recommended courses:

- Objective-C Language
- Mobile Development – iPhone
- Mobile Development – Advanced iPhone
- Introduction to Java
- Mobile Development – Android
- Mobile Development – Capstone
- *9 hours of any other Computer Information Systems courses*

Mobile Application Development is the process by which applications are developed for small low-power handheld devices such as personal digital assistants, enterprise digital assistants, tablet computers, or mobile phones. These applications are either pre-installed on phones during manufacturing, or downloaded by customers from "app" stores and other mobile software distribution platforms.

Student Flexibility:

This program specifically focuses on the most relevant and up-to-date technologies in use such as Apple’s iOS, Google’s Android, and most recently Windows Phone 7. The primary idea for this option is for the student to take courses related to trends in Mobile development languages and current platforms.

Faculty Flexibility:

Trends in Mobile development are changing by the month; however the industry is now able to have a clear focus on a few platforms and will likely continue, even if another platform enters the market. This program allows for the course options to be interchanged with newer technologies once they arrive, without having to change the structure of the option, let alone the degree.

Web Development Option*Recommended courses:*

- Scripting
- Database Design and SQL
- ASP.NET
- Ruby
- Rails I
- Rails II
- *9 hours of any other Computer Information Systems courses*

Web Application Development is the process and practice of developing web applications. A Web Application is traditional software that is used over the internet via a browser, rather than an installed version located on the user's computer.

Student Flexibility:

This program specifically focuses on the most relevant and up-to-date technologies in use such as ASP.NET, Ruby on Rails, AJAX, etc. The idea for this option however, is for the student to take courses related to trends in Web development languages and current platforms.

Faculty Flexibility:

Trends in Web development do change often, but only when significant needs aren't being met in the industry. Because more applications are being written specifically for the web, new technologies are needed in order to offer the same features and results available in desktop applications. This program allows for the course options to be interchanged with newer technologies once they arrive, without having to change the structure of the option, let alone the degree.

Information Technology Option

- 18-27 hours of any Computer Information Systems courses

- Up to 18 hours of prior experience in an Information Technology specialty awarded as advanced standing credit
 - Apprenticeship I
 - Apprenticeship II
 - Apprenticeship III

The Information Technology option seeks to provide maximum flexibility in designing a course curriculum through electives which meets the needs of students in the Information Technology field. This degree is designed to allow graduates with prior work experience the ability to count those experiences as advanced standing credit. This significantly lessens that amount of courses that need to be completed within the training institution.

CEER Employment Evaluation

Results of the 2010 Wavebreak Employment Survey

In July 2010, a survey was administered to Wavebreak cohort students to ascertain their level of interest in receiving job-search assistance from Wavebreak staff. Findings from the survey are summarized below.

Thirty-five of the sixty-one students invited to participate in the survey responded, for a response rate of 57.4%. Of the thirty-five who responded, eighty percent (80%) indicated that they are male and twenty percent (20%) female. This means that with regard to gender, the sample that responded is representative of the group as a whole, as eighty-two percent (82%) of the cohort is male and eighteen percent (18%) female. Other demographics of the sample, such as age ranges and education, are illustrated in Figures 1 and 2 below.

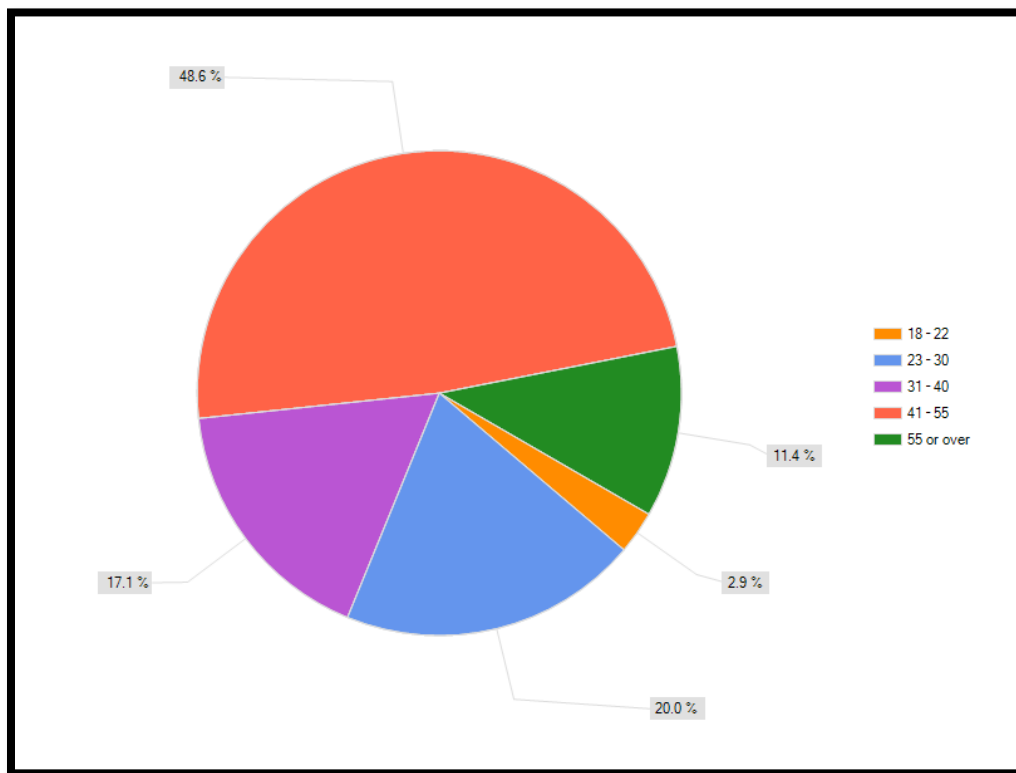


Figure 1 Age of Respondents

Seventeen students (48.6%) reported ages in the 41-55 range, and six (17.1%) reported being in the 31-40 years age range, indicating that Wavebreak has been successful in attracting and retaining students

from the target demographic of mid-career workers who find themselves in need of updated or new skills.

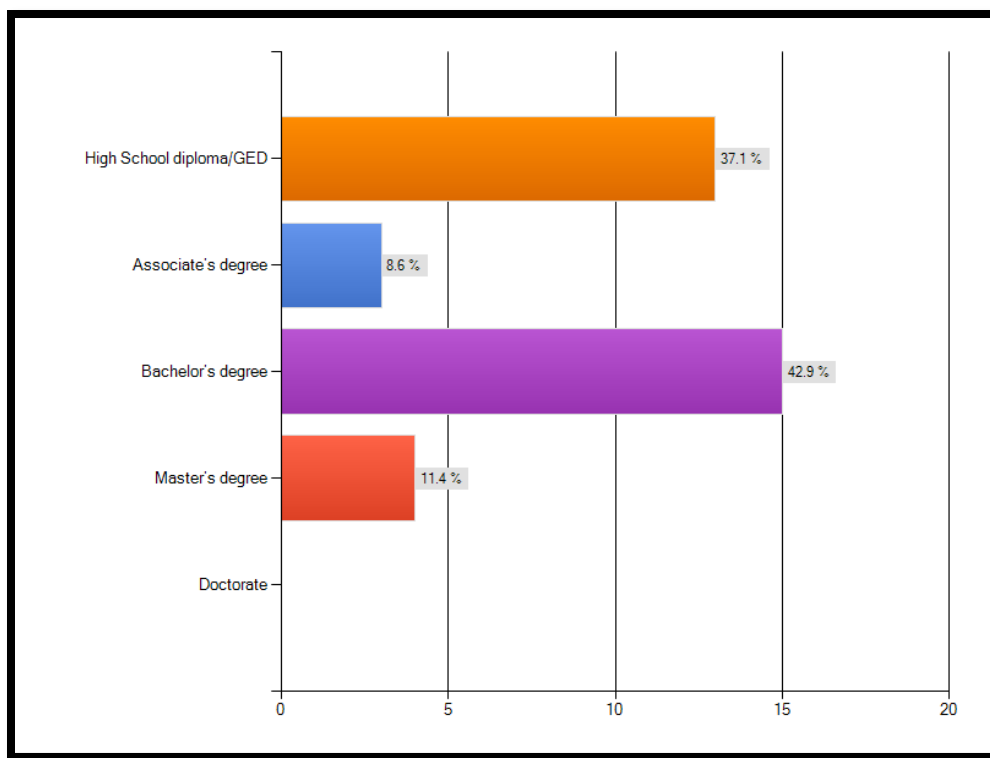


Figure 2 Highest Level of Education Completed to Date

As Figure 2 shows, the majority of respondents (fifteen or 42.9%) had completed a Bachelor's degree before joining Wavebreak; the second largest category (thirteen students or 37.1%) reported having completed a high school diploma or GED. Four students (11.4%) reported having Master's degrees and three (8.6%) Associate's degrees.

The next two items on the survey asked respondents about their goals regarding the Wavebreak program. The first asked about the pathway each student is following, and the second asked students to indicate what level of certificate or degree they are after. Their responses are shown in Figures 3 and 4.

Roughly forty-six percent (sixteen) chose the Mobile Applications Development pathway, thirty-seven percent (37% or thirteen) the Cloud Computing pathway, and seventeen percent (17% or six) the Web Application Development pathway. Fifty-seven percent (57.1% or twenty) of the respondents are pursuing a certificate which requires a total of eighteen hours, thirty-one percent (31.4% or eleven) are pursuing a Technology Associate's degree which requires an additional forty-two hours, and four (17.1%) respondents selected the "Other" response. -Their comments reveal that two of the respondents in fact are no longer enrolled in the Wavebreak program; one student indicated that they would be interested in the Associate's option "but this option hasn't been explained to me," and the fourth indicated that they are pursuing a certificate with Wavebreak but an Associate's degree in English.

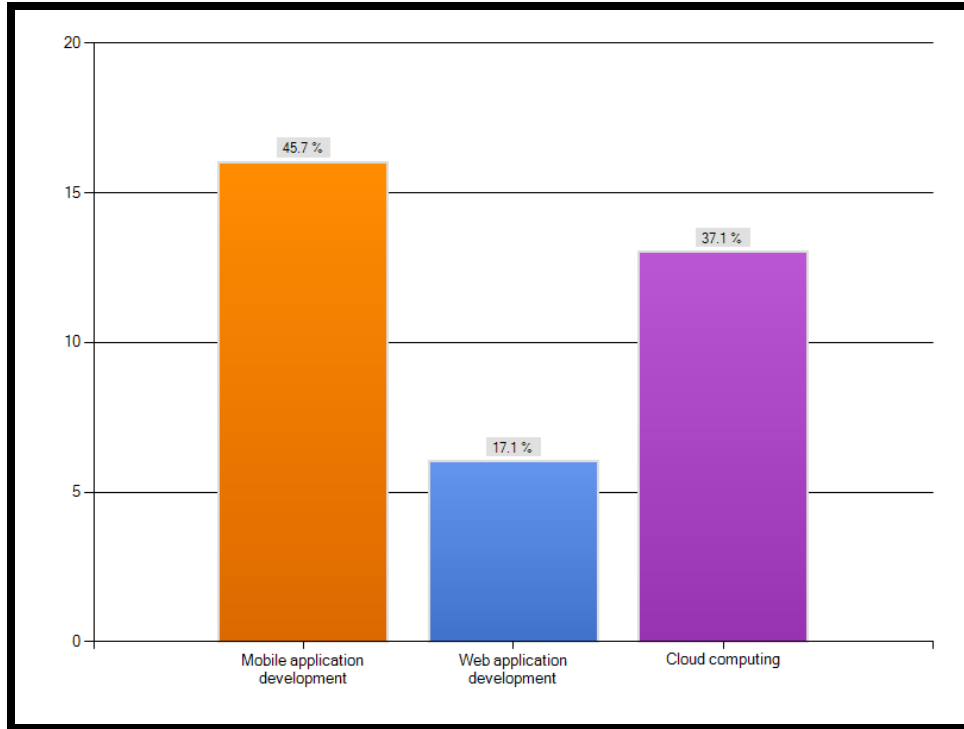


Figure 3 Wavebreak Pathways of Respondents

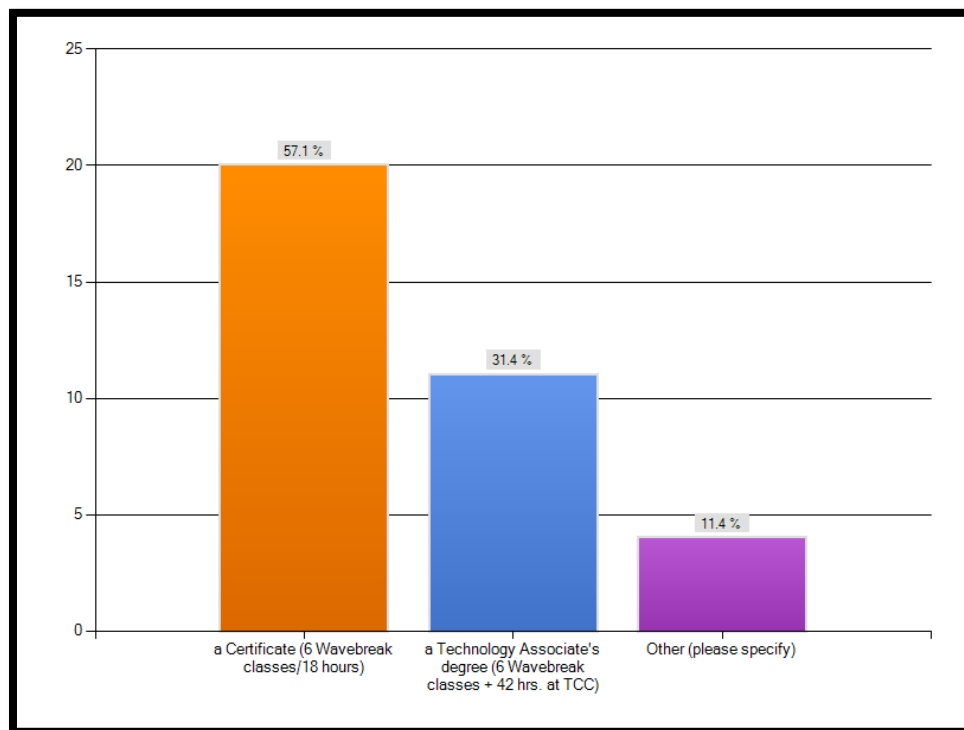


Figure 4 Educational Goals of Respondents

The next four items ask participants about employment. Figure 5 shows the number of respondents who are currently employed¹ full or part time: twenty-six (74.3%) reported being employed full time, three respondents (8.6%) are employed part-time and six (17.1%) reported being unemployed.

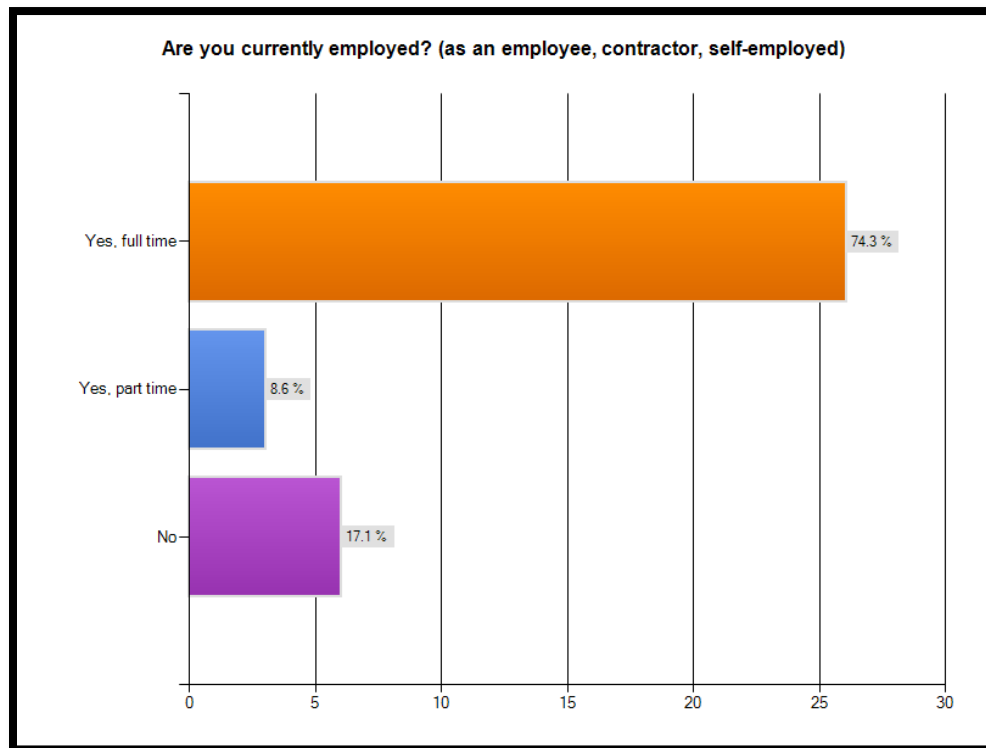


Figure 5 Employment Status of Respondents

The next item concerning employment bears citing in full, as it reads, **“Do you feel reasonably secure in your present position? -That is, the position is not temporary; not paid for by short-term grant funds; not known to be at-risk due to the recession, etc.”** Figure 6 on the next page shows how participants responded. Seventeen (48.6%) reported feeling “reasonably secure,” nine (25.7%) reported not feeling secure, five (14.3%) are not currently working, and four (11.4%) selected “Other” as a response.

¹ “employed” included those who are self-employed or working as a contractor

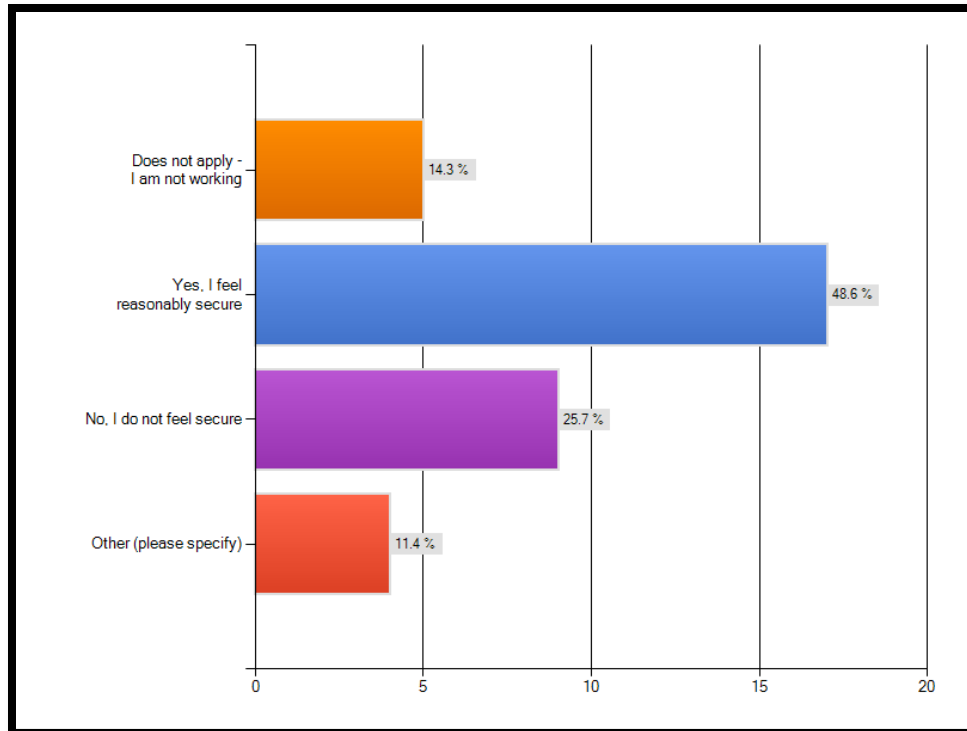


Figure 6 Respondents' Confidence Levels RE: Work

The responses of the four (11.4%) who chose “Other” are very interesting as they provide insight into a cross-section of workers who might seem to be in stable positions at first glance but who perceive their situation to be unstable or potentially at risk. The four comments are presented in their entirety.

“I work projection at a movie theater that currently uses 35mm projectors. By the end of the year we will be upgrading to all digital projectors and I will no longer be needed as a projectionist, but will be able to seek promotion to management if desired.” -Male, HS diploma, age 18-22

“The job is permanent, full time. However company policy has been to shift job duties outside of the US. Several groups similar to the one I work with have already been shut down in Tulsa, being migrated to Argentina or Brazil. Due to this company policy/trend, I do not feel secure in my present position.” –Male, Bachelor’s degree, age 41-55

“I’m a long-time employee, and feel reasonably secure for the short-, even medium-term, but I perceive that my employer does not have an intelligent long-term outlook, and has become capricious and erratic in their attitude toward “legacy system” workers.” –Male, Bachelor’s degree, age 55 and over

“I recently lost my job and am having trouble finding another, and what is available is a far cry from anything development related. So no - even if I am able to find anything I doubt it will be secure or related to development out of necessity.” –Male, HS diploma, age 41-55

Next, respondents were asked whether their current job provided them with opportunities to use any of the skills that they were acquiring as a result of Wavebreak training. The majority, twenty-one or sixty

percent, said 'no,' while twenty-one (40%) said 'yes' Seven respondents chose to add comments; three indicated that while they are not able to apply the skills directly, their new knowledge was helping them to interact and communicate more successfully with colleagues in IT areas; one explained that he is currently not employed; another reported using networking skills but only occasionally, and one reported that his/her employer takes advantage of the new skills but refuses to pay the employee "accordingly."

The last item concerning employment asked participants if they would like assistance with employment relevant to their Wavebreak training. Only five (14.3%) responded in the negative, the rest (85.7%) answered 'yes' or 'maybe' as Figure 7 illustrates.

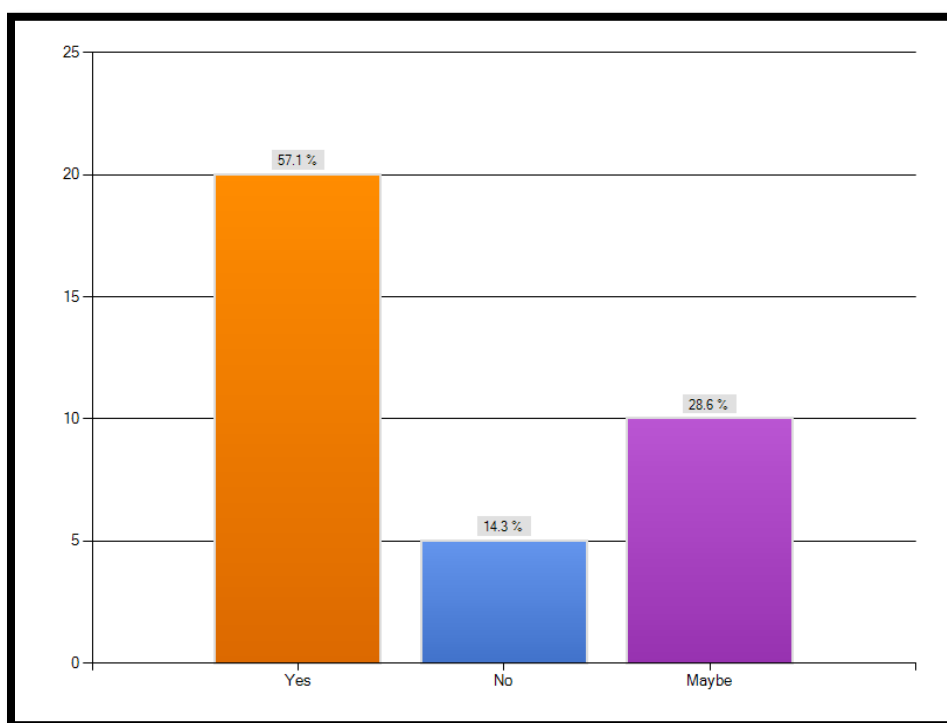


Figure 7 Respondents' Interest in Job Assistance

Asked to provide examples of the type of help they would like, twenty-eight of the thirty respondents responded. Roughly ten of these stated that they would be grateful for any help at all in identifying local openings, and the names of companies who might be hiring, and one added that they would appreciate help with resume writing and the whole job search process. Others were more specific, saying that they would like leads to companies hiring in their area of specialization, such as mobile applications or web development, and companies where a long-term prospect might be more likely.

A couple of students without previous IT job experience indicated that assistance in getting an entry level position or internship, and/or providing references or testimonials would be of help. While some indicated that a simple list of openings and possible employers in the Tulsa area would be helpful, one

student enumerated a number of actions that would be helpful, and which are likely to be in line with Wavebreak project ideas or plans. They are:

- * A job fair.
- * Contact information for employers currently hiring, or planning to hire in the next year (both local employers and any out of town/state employers that TCC/Wavebreak might have contact with).
- * Recommendations and/or references from TCC/Wavebreak based on student performance/ability shown.
- * Any assistance available that hasn't been mentioned.

The final item on the survey asked respondents if they had any additional comments or suggestions to make regarding the Wavebreak program; fifteen chose to respond. Twelve (80%) were in essence extremely positive, with some simply expressing gratitude for the program and their participation in it. A few of these also contained some suggestions for improvements to the program, and these suggestions are provided below:

"I've enjoyed the program. I would have liked more in-class opportunities with the more time intensive classes (i.e. ICND2-CCNA)"

"Overall the Wavebreak program has been outstanding. I feel blessed to have the opportunity to participate. The only critique I have is that there have been a couple of classes that were abbreviated to eight weeks, but should have been the full sixteen weeks in order to adequately cover the material. I am able to study outside of the coursework to fill in the gaps; however, if I had to take the Cisco certifications immediately after finishing the classes, I do not believe I would be prepared (we often have to cover three or four chapters in one week, which is not enough time to really take in the information)."

"The program has been awesome so far. I don't feel necessarily that I can go right into a Mobile development job today, but I feel I have the tools to get to where I need to be quickly because of the tools and jump start the Wavebreak program has provided to me. We have yet to cover the Capstone portion of the course, but I expect it to fill a lot of the gaps with real-world experience."

"I think the program is great, though like most software development programs it touches on basics and not as much on real-world development. Perhaps some additional courses that touch on what it is like to work in a development environment might be helpful to those who have no experience in it."

One other respondent stated that they assumed that job assistance would be an integral part of the Wavebreak program since its focus was on re-training, and another respondent (who is no longer in the program) expressed disappointment not just with Wavebreak but with the entire degree-completion process. His/her comments reveal that he/she has been pursuing a degree for six years and is frustrated because in their eyes they have not been provided with good advisement all along the way, so that they "have lost faith in the college system." This is certainly regrettable but is not really a valid critique of the

quality or content of the Wavebreak program per se. More representative of the perceptions of participants are comments such as this one,

“Thank you for this great opportunity! I plan to take full advantage of the skills and degree that I would not be attaining without this program.”

In summary, the majority of respondents report that they have gained new skills from their participation in the Wavebreak cohort, but many also indicate a need for assistance with finding employment relevant to their training and level of education. Most implied that they would prefer to remain in the Tulsa area, but a few may be willing to relocate given the right opportunity. Given the slow pace of recovery that much of the country appears to be experiencing, it is likely that any employment assistance would be well-received.

CEER Student & Faculty Surveys

Tulsa Community College Wavebreak Program:

Evaluation Results of Student and Faculty Surveys

September 2009

Introduction

The Center for Educational Evaluation and Research (CEER) is serving as the external evaluator of Tulsa Community College's Wavebreak Program, funded in part by a grant from the US Department of Labor. The purpose of the program is to assist the Tulsa area workforce in acquiring up-to-date information technology skills relevant to local business and industry. To date, faculty at Tulsa Community College (TCC) have received support from Wavebreak to attend training to upgrade and update their own skills in order that they may better meet the needs of students, and by extension, the local workforce and economy; and the first cohort of students have started Wavebreak-related courses through TCC. In collaboration with Wavebreak project staff, CEER developed separate surveys to collect data from faculty and students and administered the surveys online. The findings from the two surveys are presented in this report.

Evaluation Plan

The evaluation approach planned by CEER to be implemented over the duration of the project is designed to answer the following key evaluation questions:

- How has the Wavebreak program impacted enrollment in information technology courses and degree pathways at TCC?
- What is the effect of the Wavebreak program on participants' information technology skills and knowledge?
- What is the effect of the intervention (i.e., the Wavebreak program) on the employment of the local IT workforce?
- What impact has the Wavebreak program had on awareness of, and interest in, IT careers among area high school students?
- How has the Wavebreak program affected relations between local industry and education providers?

Implementing evaluation activities to address the key evaluation questions will provide both formative and summative evaluation data. Formative data will be provided to project staff to assist them with refining the program over time to meet the dynamic needs of participants (students, faculty, industry, etc.) and to stay in line with economic and administrative realities. Summative data should provide project staff and the funding agency with an objective measurement of how well the intervention met

its goals and objectives, and potentially suggest ways in which future interventions can be improved and/or enhanced.

The faculty and student surveys administered in August 2009 are designed to collect formative data to provide project staff with initial feedback on how their efforts to date are or are not having the desired results, and to help guide them as they proceed answer the first three key evaluation questions found in Appendix A.

Methods and Results of the Student Survey

The first invitation to students to take the survey was sent via email on August 17, with a second request sent out on August 20, 2009. The invitation was sent to twenty-two students, including six who had recently been dis-enrolled from the program due to unsatisfactory performance. Fifteen students responded to the survey, for a response rate of 68%; this number includes responses from three of the dis-enrolled students. (Note: a separate query was sent to two students who dropped out of the program early of their own accord.)

Demographics of Students: Two-thirds (10 or 66.7%) of the students are male; sixty percent indicated that the highest education level they have completed to date is a high school diploma or GED, while the remaining forty percent have completed a Bachelor's degree. Figure 1 shows the distribution of students by age range with the largest proportion being in the 41-55 years group.

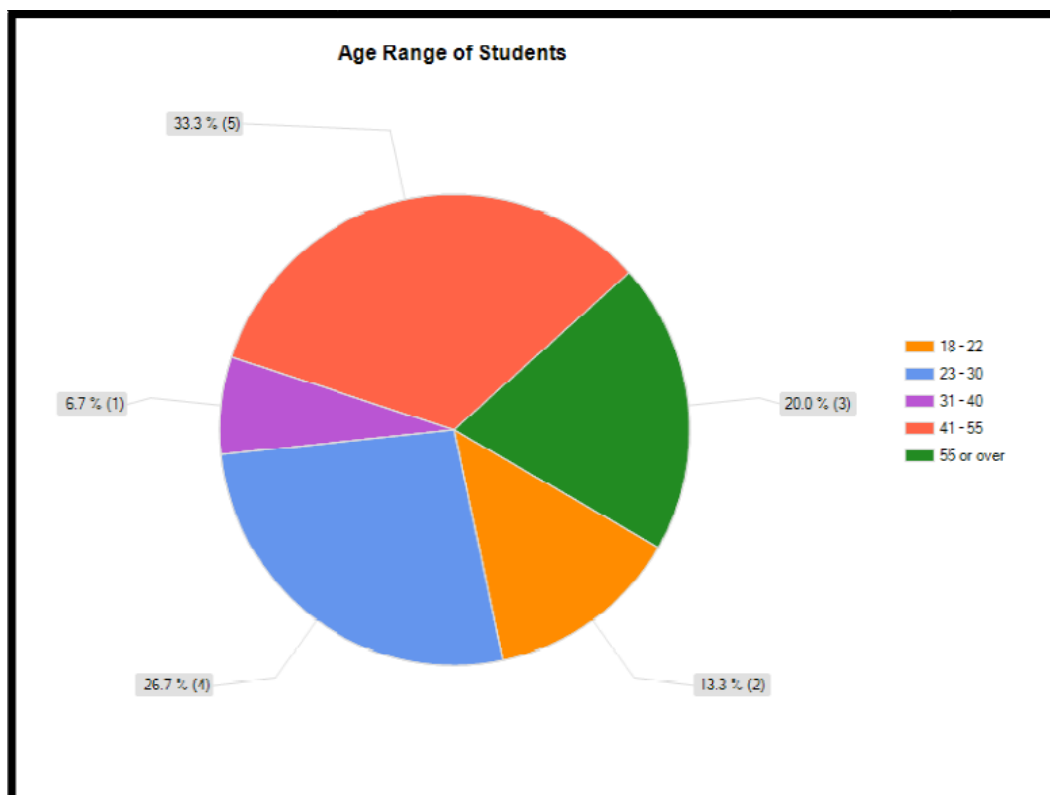


Figure 8

Participation in Wavebreak: Four courses that support the Wavebreak program have been offered to students since July 2009; two general education classes (Computer Concepts and Management Essentials) and two courses specific to Wavebreak (XHTML and ITIL Foundations.) Students have the option of taking courses in two formats: online and in the classroom. Generally, students have opted for the online format, with the exception of the XHTML course and the Computer Concepts course. Figure 2 provides details on course participation as of August 2009.

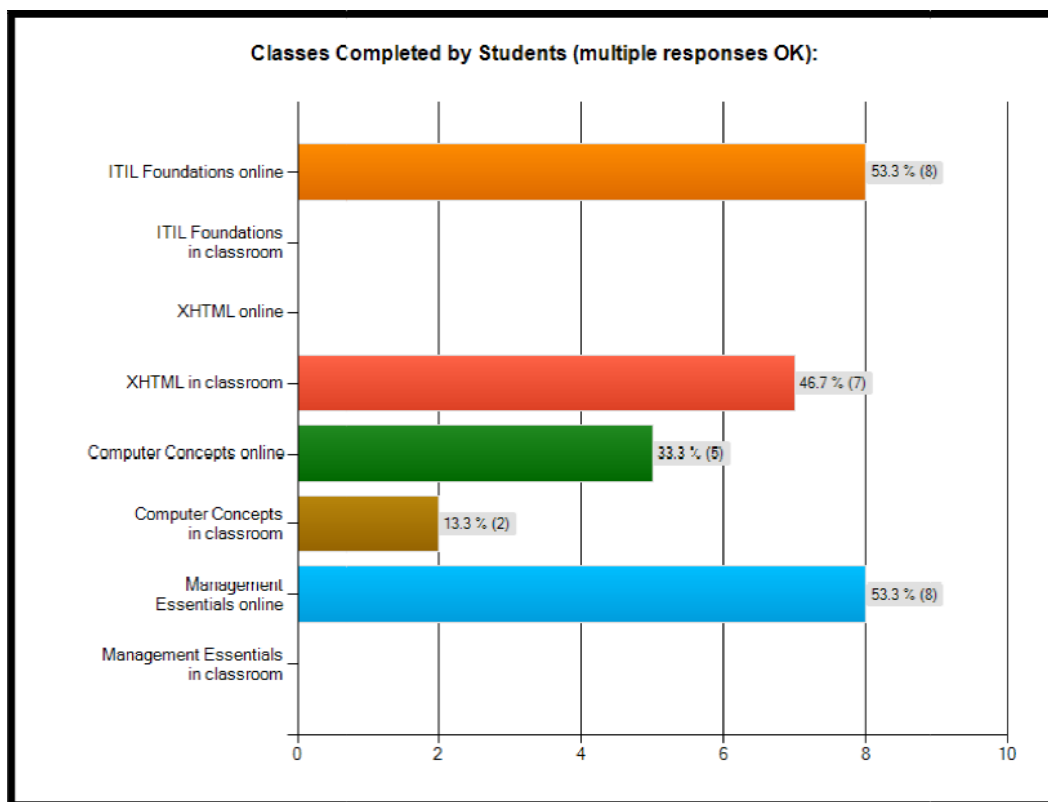


Figure 9

Students participating in Wavebreak also have a choice of three pathways to follow: Mobile Applications, Web Applications Development, or Cloud Computing. Of the current cohort of students, just over half (eight or 53.3%) have chosen the Web Application Development option, with the remainder (seven or 46.7%) opting for Cloud Computing; no students are currently pursuing the Mobile Applications pathway. In written comments provided at the end of the survey, two students expressed a desire to be able to follow more than one pathway at a time, and to have greater flexibility in changing pathways after starting in one and discovering that a different pathway may suit them better.

Participants were asked to indicate what level of qualification they are currently pursuing: most (53.3%) are interested in completing a Technology Associate's degree, but some want to stop at the certificate level while others want to pursue a higher degree. Figure 3 shows all results.

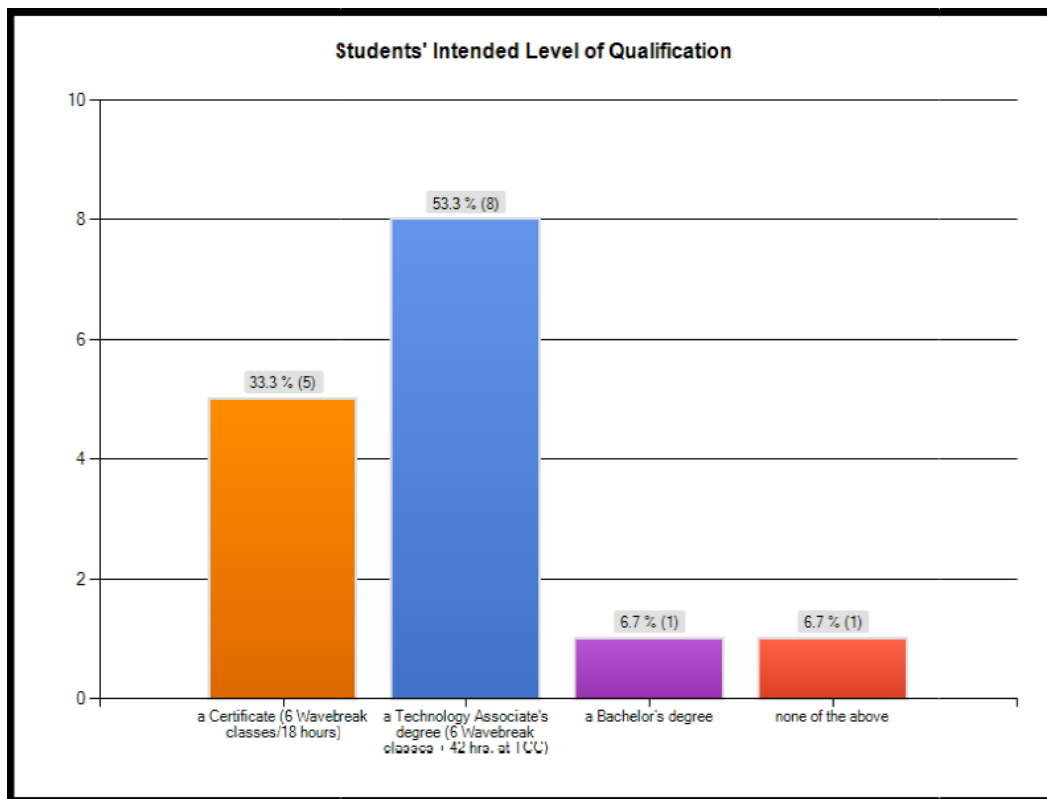


Figure 10

Two questions asked students to provide some feedback on the perceived level of preparedness of the instructors; the first asked if the instructor demonstrated knowledge of the content area, to which 93.3% (i.e., all but one student) responded “yes,” and the second asked if the instructor demonstrated familiarity with local industry’s needs. Thirteen students (86.7%) responded “yes” to the second question and two “no.” In written comments pertinent to student satisfaction with the courses, one student observed that “the classes and instructors are great” but added,

“Some of the classes I am in currently and a summer course I took were unstructured and there were problems, but it is understandable as I have been led to believe that these classes had not been taught before this time.”

A student no longer in the program described one of the instructor’s (Noah Singer) teaching style as “brilliant,” while another student noted that he/she would like to see web design courses added to the Web Development pathway. Altogether, these findings suggest a high level of student satisfaction with the courses to date, specifically the quality and relevance of the instructors’ skills and knowledge

Wavebreak Program and Employment: While over four-fifths of participants (13 or 86.7%) reported having previous work experience in the Information Technology (IT) field, only one third (five participants or 33.3%) reported that they are currently working in IT; another one-third

indicated that they are not working at all. Of the nine students (60%) who are employed, four (26.7%) said that they are only employed part-time. Those participants currently working in IT anticipate that their participation in Wavebreak will assist them to obtain a higher level position or new job, help them keep their current job, help them earn more money, or all three; Figure 4 illustrates how all participants responded to the question on the impact of Wavebreak.

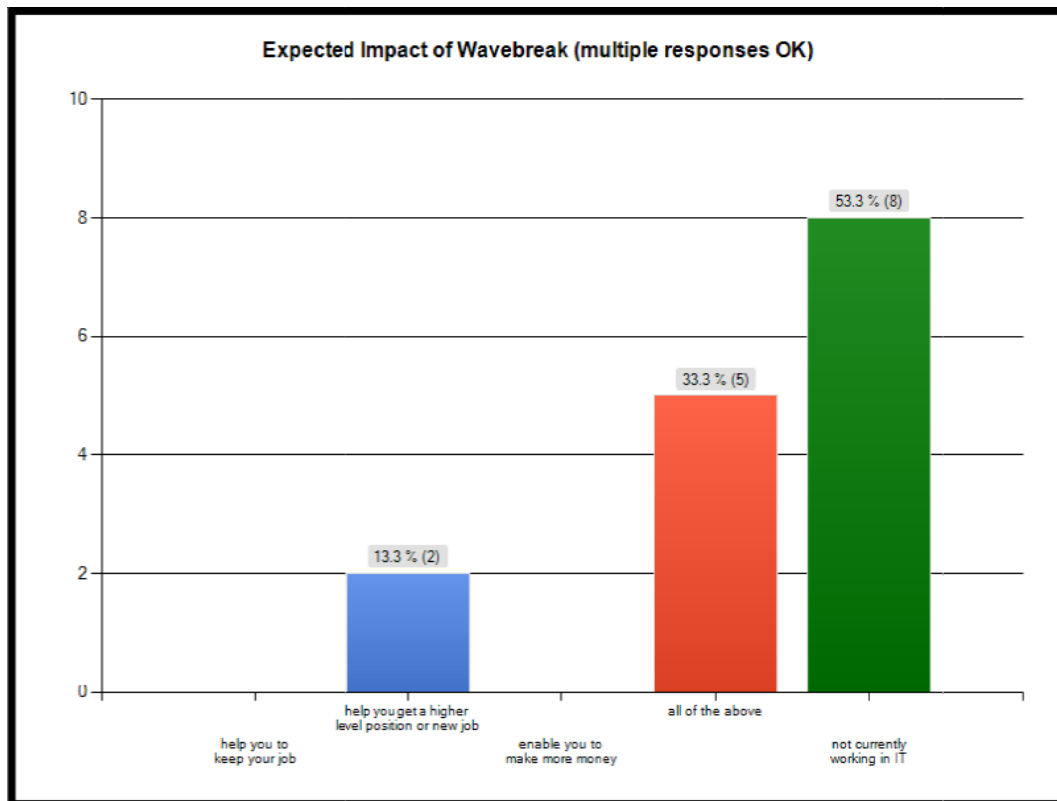


Figure 11

All participants, both those currently employed and not, were asked how positive they were that taking part in the Wavebreak program would benefit them in their *future* employment; nine (60%) responded that they were “very positive,” while the remaining six participants’ responses were evenly distributed across the other three response options, which included “fairly positive; the IT skills I am getting are in demand but the downturn in the economy may mean that there are fewer jobs available,” “not sure, it is too soon for me to say,” and “does not apply to me.” Figure 5 shows all responses.

Overall, these findings related to Wavebreak and the local workforce suggest that the program is being successful in attracting the target population of incumbent, under- and unemployed IT workers in the Tulsa area, and in instilling confidence in the majority of them regarding their enhanced employability in the future.

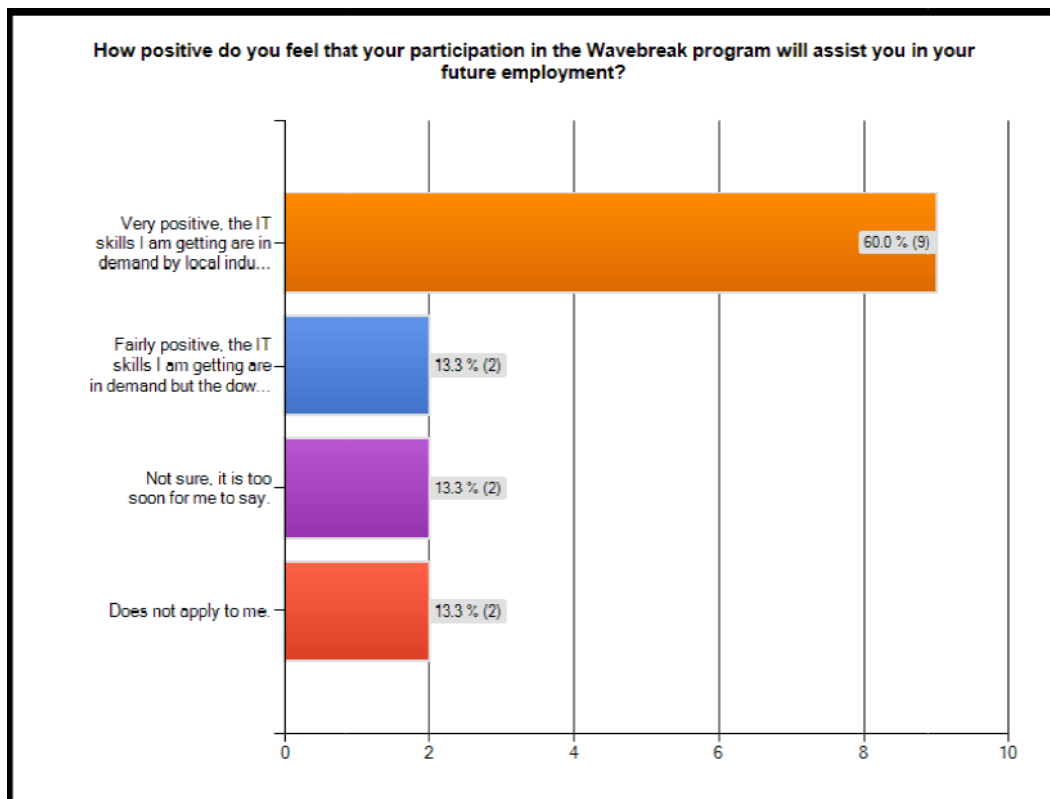


Figure 12

Finally, since all students participating in the program as part of a cohort have their tuition and fees paid for by the program, the evaluators wanted to ascertain how critical the financial support is to students, and also whether students would want to continue in the program should they have to leave due to not being able to maintain the performance and attendance standards required by the program. Figure 6 shows how students responded with regard to financial support, and Figure 7 shows responses related to interest in continuing the program without support.

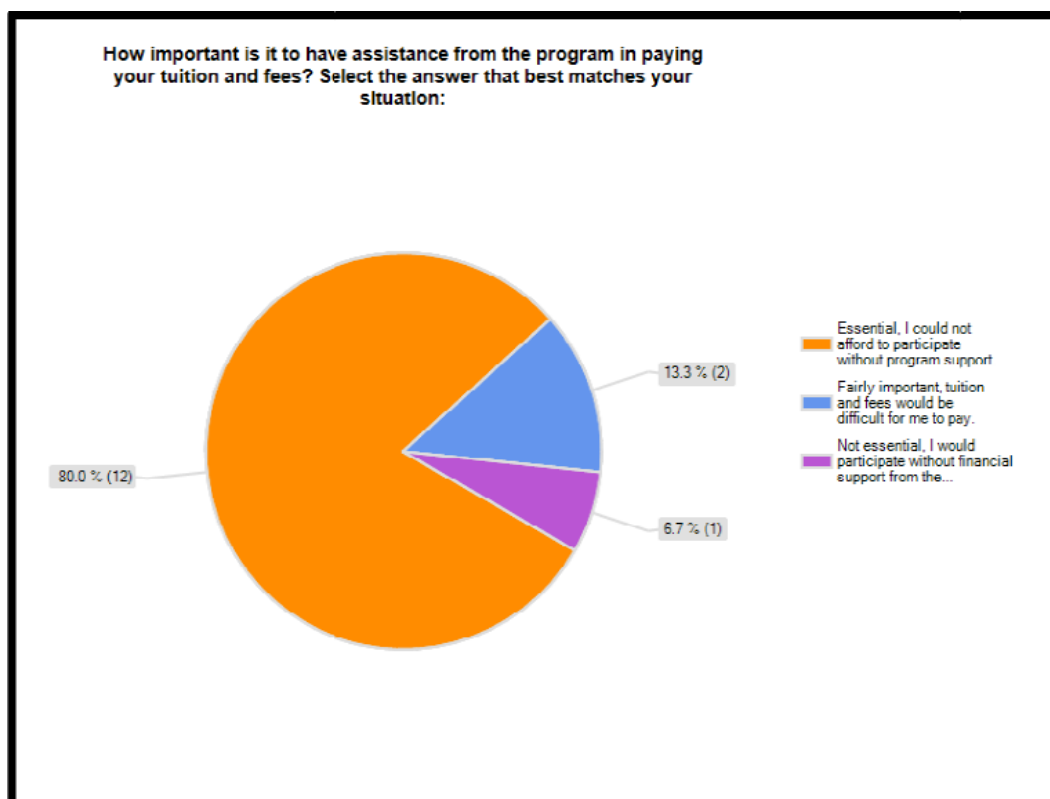


Figure 13

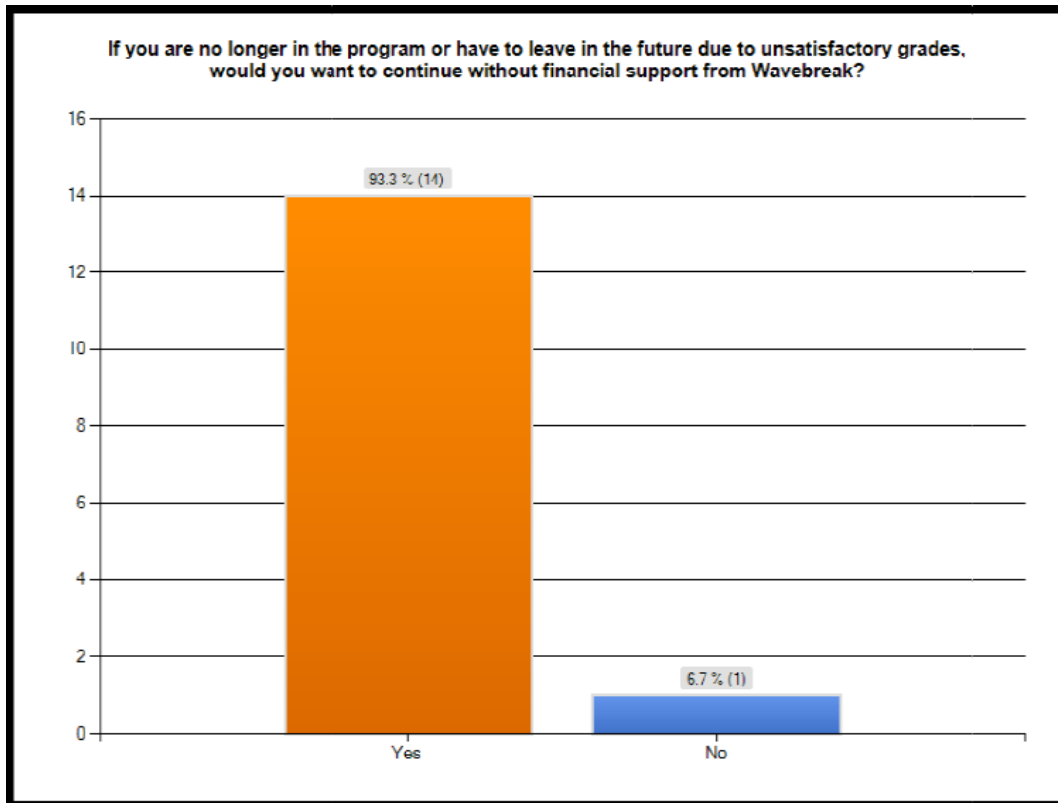


Figure 14

As Figures 6 and 7 demonstrate, although financial support is essential to eighty percent of current participants (twelve students), over ninety percent (93.3% or fourteen students) would want to continue with the program if they were to lose financial support. In written comments, two students clarified these responses by adding that while they would definitely “want” to continue with the Wavebreak program, they would be unable to do so at this point in time because of financial hardship. A third student simply stated,

“This program is a great opportunity for me to get ahead in this job climate. I could not do it without Wavebreak financial help.”

One of the students who had to leave the program before completion because of unsatisfactory grade and attendance issues, expressed frustration with what she viewed to be the unfairly rigid application of the program’s policy on participation to her situation. Sadly, on account of unexpected family demands on her time, this student missed many class sessions early in the summer semester. This resulted in the student being automatically un-enrolled from one class, receiving an “incomplete” grade in a second class, and a grade of “F” in the third. In spite of the student’s attempts to make up missed work, the combined effect of these actions (determined by TCC faculty, not Wavebreak program staff) meant that the student did not meet the minimum requirements set for continued participation in Wavebreak and so had to leave the program. The evaluators discussed the situation with program staff who expressed

sincere regret at the unfortunate confluence of events that lead to her removal, but also stated that in addition to the fact that all grading of students' academic performance is conducted by the responsible TCC faculty and outside the influence of Wavebreak program staff, they also felt ethically obligated to adhere to program policy in fairness to all Wavebreak participants, past, current and future. A second Wavebreak participant, who also had to leave the program due to unsatisfactory grades in required courses, commented on the survey that he felt that he "wasn't given accurate grades in the courses, despite having necessary understanding of material and concepts." The unfortunate experiences of these two students suggest that in spite of having work experience in IT, some program participants may be unaccustomed to the rigors of post-secondary study and may find the course work more demanding than anticipated.

In summary, findings from the first student survey indicate that the Wavebreak program is off to a good start, and overall is meeting the needs and expectations of the target population. The financial support the program provides is critical to participants, both those who are employed and those who are not. Given that many participants fall into the "mature" or "returning" student category, it may be prudent to ensure that all Wavebreak participants receive or are offered counseling and/or workshops on study skills, time management, and clear descriptions of what constitutes successful academic performance.

Methods and Results of the Faculty Survey

The first invitation to faculty to take the survey was sent via email on August 20, with a second request sent out on August 24, 2009. The invitation was sent to six faculty who are currently, or will in the near future, teach courses supporting the three Wavebreak IT pathways. Three faculty responded to the online survey, for a response rate of fifty percent. A summary of the findings is presented below.

All three faculty reported working as full-time instructors at TCC. At the time of the survey, only one had taught courses in support of the Wavebreak program, but two of the three respondents are involved in curriculum development for the Wavebreak program, and all three are teaching in the fall semester. Figure 8 provides details on the courses and formats taught by faculty responding to the survey.

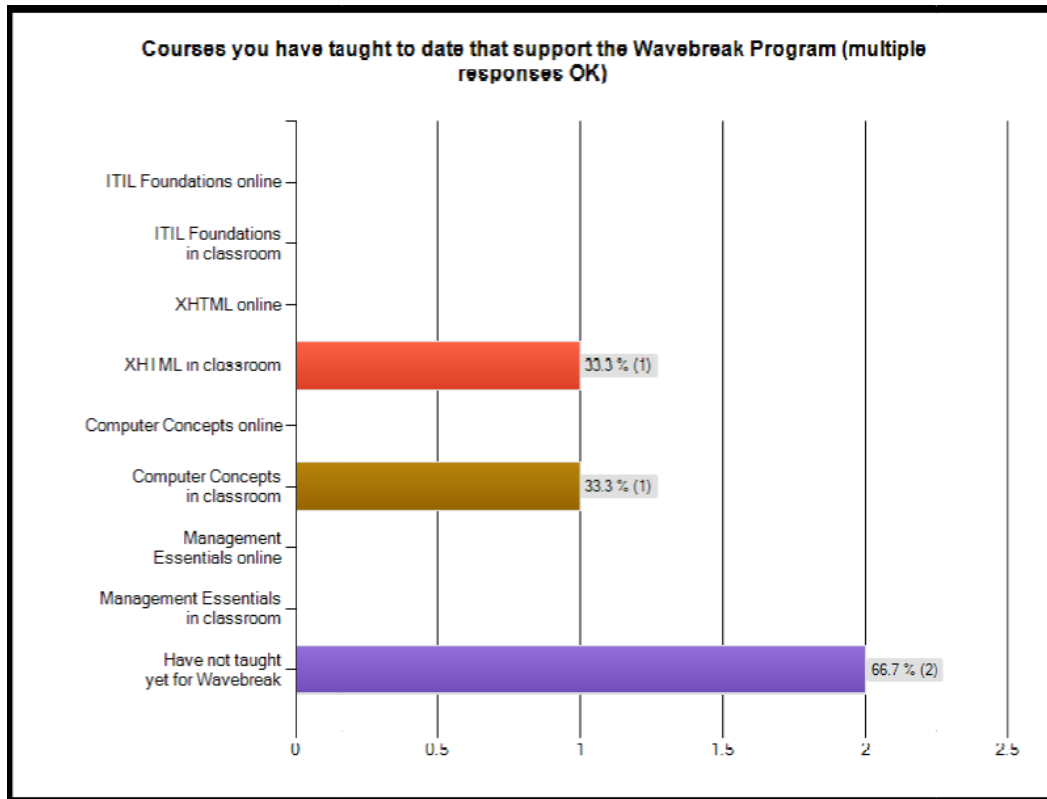


Figure 15

According to these faculty, the courses offered during the fall semester are a combination of online, in classroom and hybrid courses (hybrid courses having both online and face-to-face components). The variety of formats being offered appears to be in keeping with the faculty's own preferences, as one faculty responded positively that the online format was "good for teaching IT" skills, while the other two faculty responded in the affirmative albeit with reservations: both chose the response option, "I think the online format is OK for IT skills but face-to-face is better." One instructor clarified his reservations by adding,

"I think it depends very much on the format of the online class. 'Traditional' online classes where students basically self-teach and then are simply evaluated online does not work well."

Faculty indicated that the specific courses they are teaching in the fall semester are: Computer Concepts (online), Scripting (online), Ruby (on campus), iPhone Development, Android Development, C-Programming, and Java Programming (all hybrid).

Two of the faculty have participated in training as a result of their participation in Wavebreak: one attended an Advanced Ruby course taught through Pragmatic Studios, and the second attended both android and iPhone development training. All three faculty reported that participating in the Wavebreak program is benefiting them professionally, and that the introduction of the Wavebreak program has

enabled TCC to improve its IT offerings. Figure 9 shows how respondents answered the question on course load, with two of the three instructors reporting an increased load due to their teaching of Wavebreak related courses.

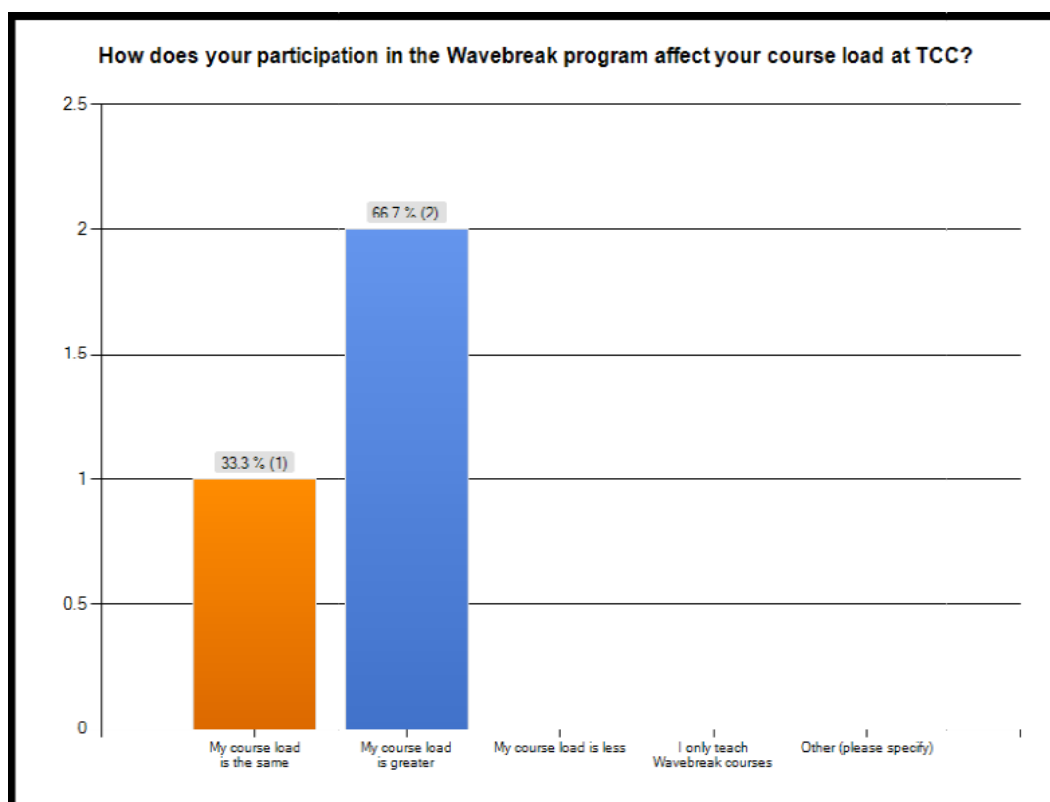


Figure 16

In response to questions regarding the faculty's familiarity with local industry, all three indicated that they personally have contacts within local industry and that they have discussed, either formally or informally, the IT training needs of these businesses with their contacts. As the result of their local ties and "inside" knowledge, all three were able to affirm that the three areas of IT selected for focus by Wavebreak (i.e., Cloud Computing, Web Application Development, and Mobile Application Development) are appropriate to local industry needs.

The survey offered faculty an opportunity to provide additional comments on their experience with the Wavebreak program thus far; only one chose to add a note, saying "the individuals managing the grant are doing a wonderful job."

To close, findings from the first faculty survey support those of the student survey, providing further evidence and confirmation that the Wavebreak program is on the right track. According to faculty who responded, Wavebreak has already brought benefits to their own professional development, and to Tulsa Community College as a whole. Hopefully, the evaluators will be able to elicit greater participation

in evaluation activities from participants in the future, especially faculty, to ensure more representative feedback that program staff can to inform and guide the program's progress and evolution.

Example Training Event Survey

1. Name:

2. Highest level of education completed to date (select one):

- ☐ High School diploma/GED
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Master's degree

3. Age range (select one):

- ☐ 18 – 22
- ☐ 23 – 30
- ☐ 31 – 40
- ☐ 41 – 55
- ☐ 55 or over

4. Gender:

- ☐ Male
- ☐ Female

5. Which workshop have you just completed? (check one only):

- ☐ Ruby in 3 Days
- ☐ iPhone Development Boot Camp

6. Are you currently a student in one of the Wavebreak cohort programs (ie mobile application development, web application development, or cloud computing)?

Select one:

- ☐ Yes
- ☐ No

7. Are you currently working in IT?

- ☐ Yes
- ☐ No

8. If you answered "no" to Question 7, are you employed?

- ☐ Yes, full time
- ☐ Yes, part time
- ☐ No

9. Do you expect that updating your skills through this workshop will (select one):

- ☐ improve your performance in your current job
- ☐ help you get a promotion or more money with your current employer
- ☐ help you to get a new job
- ☐ all of the above
- ☐ Other (please specify)

10. How would you rate the content knowledge of the workshop instructor(s)?

- ☐ Excellent, very comprehensive
- ☐ Good in most areas
- ☐ Fair, better in some areas than others
- ☐ Poor, should not be leading a workshop

11. How would you rate the professionalism of the instructor(s)?

- ☐ Excellent
- ☐ Fair
- ☐ Poor

12. Did the instructor(s) present the material in a variety of formats (lecture, hands-on, discussion, etc.) to address different learning styles?

- ☐ Yes
- ☐ No

13. Do you feel you had adequate opportunities to practice the new skills you acquired?

- ☐ Yes
- ☐ No

If your response was "yes," please explain why:

14. Did the instructor(s) allow adequate time for questions and concerns during the workshop?

- ☐ Yes
- ☐ No

15. Overall, how would you rate the pace of the workshop, given the amount of material that was presented?:

- ☐ Too slow, at times I was bored
- ☐ Slow, but it gave me more time to practice
- ☐ Just about right
- ☐ Fast, but I was able to keep up
- ☐ Too fast, I felt overwhelmed

16. Did the instructor(s) demonstrate a familiarity with local business needs?

- ☐ Yes
- ☐ No

17. Do you feel that you had the necessary prerequisite skills and knowledge to benefit fully from this workshop?

- ☐ Yes
- ☐ No

If your response was "yes," please explain why:

18. Were you surprised that an IT workshop like this one was offered through Tulsa Community College?

- ☐ No
- ☐ Yes

If your response was "yes," please explain why:

19. Would you be interested in more workshops like this at Tulsa Community College?

- ☐ No
- ☐ Yes

If you responded "yes," can you suggest some topics for future workshops?

20. Who paid the fees for this workshop?

- ☐ Myself
- ☐ My employer
- ☐ Other (please specify)

21. Now that you have completed the workshop, how positive do you feel that what you have learned will assist you in your employment? Select one:

- ☐ Very positive, the IT skills I gained are in demand by my employer and others in the area.
- ☐ Fairly positive, the IT skills I gained are in demand but I'm not sure I can apply them immediately.
- ☐ Not sure, it is too soon for me to say.

22. If you have any comments, or suggestions on how this workshop could be improved, please add them here: