# Project EL/Tech: Integrating for Advancement

## A Project-based, Computer-delivered Model

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## Introduction

Project EL/Tech, an integrated ESL and Tech Literacy model, was created during contract and in collaboration with the Department of Information Technology. This model serves as a framework for developing and implementing curriculum intended to meet the needs of refugees and immigrants who lack English language skills and an employment credential, as well as the needs of the organizations that serve them. To create this model for the specific needs of Seattle, we employed multiple methods of analysis including a community needs assessment and a national review of computer-based education models. We examined current and projected employment pathways in Seattle and determined the skills needed to be competitive in each field. Finally, we reviewed technology competencies required to be an active and engaged participant of the 21$^{st}$ century.

The community needs analysis was conducted to determine who would benefit from a project-based, computer-assisted learning model in the city of Seattle, and what the current environment, assets, and challenges are in the computer learning centers serving these residents. We reviewed nine organizations in the city of Seattle: Literacy Source, Neighborhood House, Helping Link, North Seattle Family Center, Goodwill, East African Community Services, Casa Latina, Yesler Community Center, and the Chinese Information and Service Center. Each of the organizations selected to interview have had success in implementing educational programming that to varying degrees incorporates technology literacy and English language skills development.

To gain a broader understanding of existing educational models that integrate technology and basic skills development, we reviewed eight models implemented nationally: ALEKS; California Distance Learning Project: Adult Learning Activities; GCF Learn Free; The Learner Web; The Math You Need When You Need It; PLATO Online Learning Solutions; Preparing for the Oath: U.S. History and Civics for Citizenship; and U.S.A. Learns.

The analyses above provided the framework for creating this project-based, computer-assisted ESL and Tech Literacy model. We found that low-skilled learners who are served in Seattle's community technology centers come to these organizations with many goals but most are seeking employment, English language and literacy skills, and technology literacy. Childcare, transportation, and work schedules are often barriers to learners attending scheduled education programs with the intensity and duration required to make progress. Learners need a flexible, customizable, modularized model that allows them to begin at the appropriate skill level, meets immediate needs, and allows them to progress toward long-term goals while working at their own pace and on their own time. Organizations need a model that is able to meet their learners' needs without placing additional burdens on already overtaxed staff and funds.

Project EL/Tech was created with the needs of this particular population of learners and the organizations that serve them in mind.

## What is Project EL/Tech?

This model provides a framework for how organizations can integrate English and technology skill building through computer-assisted projects designed to provide significant learning regardless of initial skill level. Project-based learning, discussed below, provides opportunities for learners to develop skills by using them to explore and create in real-life contexts. This model integrates both technology and English language skills through guided projects that are assisted, enhanced, and dependent on computer

resources.  The goals of this model include improving English and technology skills; computers are an important platform for instruction.  However, computers cannot be the sole instructor, since certain levels of English language skills are necessary in order to use them.  Group projects and individual assignments supported by staff or volunteer facilitators are key features of this model, allowing instruction to vary depending on organizational capacity.  The model intends to enhance learning for participants by developing multiple skills at once while meeting initial or basic needs such as learning English, setting up an email account, or finding a job.

Any model that intends to develop skills must have measures for tracking participant progress and assessing learning.  This model incorporates assessment of English language and technology skills so that organizations can effectively monitor, track, and report on participant progress.

## What is project-based learning?

Project-based learning is an intentional approach to instruction that guides participants' learning of multiple skills at once through relevant life activities and materials.  Project-based learning is intended to relate specific competencies, i.e. technology and language, to learners' lives through real-world projects that connect to the needs and interests of each learner.  Learning is enhanced when an individual can see the direct relationship between skill-building and application in their own lives.   Adult learners approach education with specific skill needs and, often, a particular idea for where and how this information will integrate into their lives.  Therefore, a key element of project-based learning is that learners are involved in the process of selecting and designing the project that will guide them to achieving their learning goals.   It is critical that the learner is at the center of the planning and instructional process.

For more information about project-based learning, including templates for developing a project-based learning plan, visit the Buck Institute for Education.

## What is Universal Design for Learning?

Universal Design for Learning (UDL) is a framework for designing learning experiences to ensure learners have a variety of ways to connect with the material.  No two people learn in the same way and providing multiple options for receiving information, expressing knowledge, and connecting content to real-life experiences meets the learning needs of the widest possible range of learners.  UDL is comprised of these three principles:

1.  *Provide multiple means of representation.*  Everyone recognizes and understands information a little differently because of differences in learning style, preferences, and abilities.  Multiple representations, such as providing text and pictures together and reading text aloud, give learners multiple opportunities to recognize and understand information; for example, a learner may never have seen a word in its written form, but may recognize it when he hears it out loud.

2.   *Provide multiple means of expression.*  Learners vary in the ways that they are best able to show what they know.  Providing options for expressing knowledge allows everyone to demonstrate what they've learned in a format that is most comfortable for them. For example, if learners are working on summarizing, they might summarize a story by acting it out, writing a summary, or talking with a

partner.  If the goal is to see how well someone can summarize a story, why test everyone on how well they can write?

3.  *Provide multiple means of engagement.*  To feel engaged with a topic, learners need to make the learning experience their own by relating it to their real-lives, needs, and interests.  But learners have different needs and interests.  For example, some are interested in using the computer for work, and some want to email their grandchildren.  Letting learners choose what kind of email they'd like to send helps connect the skill of emailing to a personal, important part of their real life.  If everybody had to write a business email, some students might feel that emailing isn't for them.

Adult learning environments are incredibly diverse.  A typical English language or technology class for immigrants and refugees, for example, is made up of people of different ages, educational backgrounds, languages, ethnicities, and genders, as well as different learning styles, preferences, and interests.  Using the principles of UDL helps address and support those differences without making separate lessons for each person.

For more information on Universal Design for Learning, visit the [Center for Applied Special Technology](#).

## Why use Project EL/Tech in Seattle?

There are currently 31, 858 residents, over the age of 25, in Seattle who do not have a high school diploma and 53, 877, over the age of 5, who speak English *less than very well*, as reported by the U.S. Bureau of the Census.[1.]  Employment pathways currently in demand in Seattle have a minimum requirement of skills such as reading comprehension, writing, math, and basic computer skills.  Adults who lack these skills and/or credential face a stark reality with limited options for employment, let alone for meeting their family's basic needs.

Community technology centers respond to residents' needs with a variety of educational programming: ESL classes, computer classes, workshops, open-lab sessions, and more.  In the analysis of a sample of these centers, representatives reported a desire to improve ability to track and assess learner skills-gains, report on those gains, and respond to the range of language and technology skills that learners come in with.  Centers also reported difficulties in integrating English language and technology literacy development due to a lack of staff capacity, resources, and knowledge.  Project EL/Tech integrates technology literacy and English language skills and provides recommendations for assessment, tracking, and implementation to meet the needs of these organizations.

This model also meets participant needs.  Some adult learners move in and out of education programs, as the demands of life allow.  Intermittent participation often results in minimal evidence of skills-gains or achievement of educational goals.  Integrating technology and English language instruction provides a possibility for skills-gains and goal-achievement in an accelerated format by decompartmentalizing learning experiences. Instead of participating in both English language classes and computing classes, learners use their limited time to simultaneously build skills.  Additionally, the skills that are integrated into this model incorporate the fundamental skills needed for employment in a variety of in-demand

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[1]  U.S. Census Bureau, 2012, August 9. Selected Social Characteristics in the United States.  Generated by Amy Hitchcock; using American FactFinder.  Retrieved from [http://factfinder2.census.gov](http://factfinder2.census.gov)

fields.  These types of models are not readily available to low-skilled learners.  Programs that are integrated fill up quickly, and often require high-level English skills.  This model intends to provide the educational community with a plan for integrating skills development, while simultaneously meeting the needs of the most underserved populations in the city.

## Who is Project EL/Tech intended for?

Project EL/Tech is intended for organizations in Seattle with community technology centers and adult education programs.  The immigrants and refugees served by these organizations typically lack English language and technology skills as well as an education or employment credential.  Learners are adults, ages 18 and above, and have varying backgrounds in formalized education and varying skills, needs, and interests.  English language skill levels range from pre-literate to intermediate.  This model is not only intended to serve those who currently access education services, but it was created to also meet the needs of adults currently not being served by existing programs.  The life circumstances of learners impact their participation in adult education programs.  Family responsibilities, hours of employment, and access to transportation, childcare, and adequate housing can all prevent learners from regularly attending education programs.  In this model, learners can participate in projects independently, with facilitator support, or in a formalized classroom environment as time and life circumstances allow.

## What are the goals for Project EL/Tech?

Project EL/Tech is intended to

1.  Integrate foundational and academic skills that are necessary for current and projected employment pathways.  The Employment and Training Administration defines these skills as:

| Foundational Skills | Academic Skills |
|---|---|
| • Applied technology | • English language proficiency |
| • Teamwork | • Reading comprehension |
| • Problem solving and decision making | • Business Writing |
| • Planning and organizing | • Math |
| • Customer focus | • Basic Computer skills |
| • Adaptability and flexibility | • Locating and using information |

2.  Prepare learners for the following current and projected employment pathways:
    - Information
    - Professional & Business Services
    - Manufacturing (Aerospace specifically)
    - Wholesale Trade
    - Retail Trade
    - Administrative Support
    - Education & Health Services
    - Leisure & Hospitality
3.  Increase the English language and technology skills of program participants.
4.  Provide flexible, customizable, modularized computer-based instruction.

5. Meet the needs of a range of pre-literate to higher-skilled learners.
6. Provide active, collaborative, contextualized learning.
7. Encourage explicit goal-setting and sequencing of instruction to meet learners' goals.
8. Provide organizations with tools for pre-assessment and diagnosis of skill gaps and learner needs.
9. Provide organizations with tools for formalized assessment and tracking of learning and skills gains.
10. Encourage partnerships between organizations who serve similar populations.

## What will participants gain from Project EL/Tech?

By building skills through integrated ESL/Tech Literacy projects, participants will be able to communicate more fluently in English, understand computers, email, and the internet, and use office software.  In addition, projects provide an opportunity for learners to build process skills.  The following goals are designed to address the range of technology, language, and process skills learners will develop.

**Goals for Learners**
Project EL/Tech will provide learners with an opportunity to
1. Increase knowledge of basic computing.
2. Gain an understanding of internet, web, and email use and safety.
3. Use basic office software.
4. Read with understanding.
5. Convey ideas in writing.
6. Speak so that others can understand.
7. Listen actively.
8. Improve process skills: learning to learn; critical thinking; and problem-solving.
9. Connect ideas to real-life contexts to enhance relevance, retention, and transfer of knowledge.

A complete list of goals and objectives for learners is available in Appendix A.

Goals one through three were adapted from the Missouri Department of Higher Education's Digital Literacy Competencies.  Many organizations have defined technology literacy standards and benchmarks, and these were chosen because they were developed specifically for adult learners and the community college student population rather than for K-12 learners.  The Missouri Department of Higher Education, in partnership with Jefferson College, Metropolitan Community College, Mineral Area College, Moberly Area Community College, and Three Rivers Community College developed a standard set of competencies that include specific skills learners should develop in order to be considered tech literate.  These skills, such as using a mouse and keyboard, are objectives for the model.  For example, one objective is that upon completion of the model, participants will be able to use a keyboard.  The facilitator can see whether the participant is completing the objectives and completion of a set of objectives adds up to achieving a goal.

Goals four through seven are Washington State Adult Learning Standards for ESL.  Learning standards provide a common language and a framework for communicating between organizations and designing curriculum.  The goals are the same for all levels, but what goal achievement looks like for learners at each level is different.  Those differences are apparent in the objectives for each level.  For example, literacy level learners will be able to recognize familiar words on their own, while a beginning learner will be able to recognize familiar words in a sentence.  A small distinction, but a crucial one.  It's

important not to hold all learners up to the same standards for proficiency.  The next section, "How will you know a participant is learning?" will demonstrate how to determine the approximate levels for each particular learner, and it will be important to keep those skill levels in mind when assessing learning and designing projects.  Additionally, a learner may not be at the same level in each skill group of reading, writing, speaking, and listening.  For example, a learner who has intermediate speaking and listening skills may be Literacy level in reading and writing if those skills are less developed.

The final two goals, goals eight and nine, are intended to address the process skills and contextualized, real-life learning that is the foundation of project-based learning.  Process skills are competencies that learners use and acquire while engaging in activities and projects that are situated within their life context, such as problem-solving, teamwork, and critical thinking.  These skills are necessary in many aspects of learners' lives and are considered foundational skills for employment pathways and further education.

These nine goals for learners and associated objectives (found in Appendix A) are intended to provide a framework for designing projects to meet participants' needs and build skills for further education or employment.   Incorporate opportunities to improve reading, writing, speaking, and listening, as well as technology and process skills into every project.

For a complete list of Missouri's Digital Literacy Competencies, please see this PDF.

For more information on Washington State Learning Standards, examples of standards-based curriculum, and descriptors of proficiency at each level visit the State Board for Community and Technical Colleges.

## How do you know a participant is learning?

In order to determine whether participants are learning, it's important to know the skills they are starting with.  Assess a learner's skills when they enter the program, throughout the learning process, and after they've completed projects.  Many organizations include assessment of skills in their student intake process, and often use post-testing to determine improvement.  This is a great strategy.  Assessing learners before, during and after instruction allows them to see evidence of their achievements and feel a sense of accomplishment.  Also, organizations can describe their participants' achievements precisely to funders, partners and community supporters, rather than through participation hours or general impressions of progress alone.

**Before Learning:**

Talk to new students.  Find out their goals, needs, and interests.  Use the initial conversation to informally assess their speaking and listening skills.  During this intake, use pre-assessments specific to the organization, or use the assessments provided in Appendix B.  Not only are these helpful for measuring improvement when repeated as a post-test after projects, but  they also provide a foundation for planning projects and providing the appropriate  level of support for learners.   Finally, pre-assessment conversations provide an opportunity to talk to participants about their goals for learning.   Finding out where learners are at the beginning of the learning process allows the facilitator to help the learner map out the steps toward the larger goals of English language and computing proficiency.  Always document the learner's pre-assessment results.

**During Learning:**
Observe learners as they work on projects.  Adjust teaching methods and provide support when necessary.   Learning happens when participants are challenged to build on what they know and to try new things.  But if the challenge is too great, participants can feel frustrated and discouraged.  Be flexible and pay attention to learners' attitudes as well as their knowledge.  In addition to observation, use more formal assessment strategies, such as Classroom Assessment Techniques[2] and be sure to document the learning gains along the way.

**After Learning:**
Use the same assessments as before learning to compare participants' skills at entry to the skills they've built through completing projects.   Use the completed projects as evidence of learning, too, to get a complete picture of how the learner is progressing.   At the end of a project, revisiting the learner's initial goals and gains made throughout the process is an opportunity for a conversation about future goals and aspirations.  Through the process of learning academic and process skills in relevant, powerful projects, learners discover what's possible.   Their immediate needs and goals evolve into aspirations that are built on the foundation of the learning in the projects.  Set new goals with learners and create a plan to reach those goals so that the learning cycle continues.

It's not only important to assess learners before, during, and after learning, it's important to track learners and the gains they make.  Often, pre- and post-testing occurs on paper.  The tests are filed away along with intake forms and other student data.  If organizations use computer-based assessments and tracking, students may be able to access their learning achievements and see areas that need improvement.  Transparency is important to adult learners.  They want to know *why*, *when,* and *how.*  It's the responsibility of facilitators to answer these questions and involve participants in their own learning.

For a visual of the project cycle which includes pre- and post- assessment, see Appendix C.

## Sample Projects

**Community Resources for Parents and Families**
For one group of participants, creating a community resource book for parents and families is an appropriate project.  First, in a group discussion, participants explore what they already know and what they want to know.  They brainstorm resources that they've used in the past and think about what they want for the future.  The facilitator supports the group by providing photos and examples of the kinds of resources available, for example, photos of children playing in an after school program and schedules of parenting classes available at the organization.  The group decides that it's important to know about family-friendly events that are happening in the city, parenting classes, how to access their children's school records on the Source, and options for childcare and after-school programs.  Using a checklist of tasks, participants divide up the work, set deadlines for completion, and agree to meet again to check in with the group.

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[2] Angelo, T. A., & Cross, K. P.  (1993).  *Classroom assessment techniques: A handbook for college teachers*.  San Francisco, CA: Jossey-Bass.

Next, students work individually to develop the skills they need to complete their tasks.  Several participants need to work on using the internet to search for after-school programs.  They practice in the computer lab in small groups.  The facilitator helps them by modeling how to open an internet browser, how to navigate to Google, and how to type in key English vocabulary.  She also shows them how to copy and paste text into Google translate to make it easier to understand what they read.  They use Excel to create a spreadsheet of after-school programs, which includes costs, times, and locations.  One participant who has intermediate speaking and listening skills decides to call the school where her child attends to find out what is available, so she first writes the questions she wants to ask and then searches for the phone number of the school using Google.  One low-literate student uses key English vocabulary to search Google images.  She copies the images into a Microsoft Word document and types captions.  She changes the size of the text and the font, and saves her work.  Participants create email accounts so they can share their work with other students and the facilitator.  The facilitator provides examples of emails and a form-letter they can use to create their first email.

Over the course of several weeks, learners research and compile their work in a Word document.   As they encounter new skills, vocabulary, and sentence structures, the facilitator supports students by providing examples, demonstrations, and templates.  Participants find maps and bus routes for events and create a checklist for signing into the Source (Seattle Public Schools' parent/student website) to include in the resource book.  Some participants decide to meet twice a week to work together.  One participant works in the evening, so she uses the computer lab on her own in the mornings after her kids go to school.  She is a beginning student, so she writes lists in short sentences to keep track of what she has learned.   Intermediate students write short paragraphs.  Literacy students create the title page of the book, listing everyone's name and country of origin, and provide photos and captions to illustrate the book.  As a group, they review the book to find mistakes.  The facilitator helps them print out their book and organize it in binders.  Everyone takes home a copy of the book, but they agree to keep one in the computer lab so that other people can use it, too.

Skills developed:
- basic computing
- reading
- listening
- learning to learn
- brainstorming
- using the internet and email
- writing
- problem-solving
- communication
- creative thinking
- using office software
- speaking
- critical thinking
- teamwork

**Employment Portfolios**
Another group of participants has employment goals, so a project to create employment portfolios is appropriate.  The group discusses the experiences they've had with employment in the U.S. and in their own countries.  The facilitator guides the discussion using questioning strategies that allow for multiple levels of speaking and listening.  He starts by asking yes or no questions, then adds either/or questions, building to information questions and hypothetical questions.   Next they talk about what they'd like to know about job seeking in the U.S.  They discuss how their portfolios will be a resource that they can carry with them when they're looking for work in the community and online.

In small groups, they collect examples of resumes, cover letters, letters of reference, and sample interview questions to build a sample employment portfolio.  Higher level students are paired with lower level students to search for samples online.  The facilitator supports this by providing examples so that learners can recognize common formats.  The lower level students observe and use a template to

record the steps to accessing information online, so that they can refer to it later.  The resumes, letters, and interview questions are printed and compiled in a notebook for future reference.

Individually, learners complete a personal skills inventory and research occupations that match their skills and interests.  They write descriptions of occupations and compile their summaries in a document to add to the class portfolio.  The facilitator supports low-literate students using Language Experience Approach, in which the facilitator types while learners dictate their description so that they can see their own words in text.

As a group, the facilitator models filling out an online job application, and learners practice individually or in pairs.  Some low-level students use simple forms with only personal information, job titles, and dates.   More advanced learners use forms with references and education sections as well.  They print their forms and begin to assemble individual employment portfolios.  Next, they fill in a simplified resume template in Microsoft Word.  Higher level students add additional documents to their portfolios, while lower level students continue to build their applications and resumes.  At the end of this project, learners present their portfolios to other participants, staff, and volunteers.

Skills developed:
- basic computing
- reading
- listening
- learning to learn

- using the internet
- writing
- creative thinking
- communication

- using office software
- speaking
- critical thinking
- teamwork


**Digital Scrapbook**
A digital scrapbook is an appropriate project for one group of participants who are interested in sharing their cultural and family stories.  To begin planning the scrapbook, participants decide on important things to know.  They want to use email and the internet.  One learner knows that his daughter posts pictures online, so they decide that they could search for images and stories from their countries to include in the scrapbook along with pictures they have of their families.  They decide to work in small groups that will each be in charge of different aspects of the scrapbook.  Using a computer projector, the facilitator compiles student suggestions in an Excel document with the names of the group members who are responsible for each portion of the scrapbook.  In their groups, students use a template to create a timeline in Excel of when each task will be completed.

Individually, participants use digital cameras to take family photos, use the internet to search for images and folklore from their countries, and write or record family stories or folktales.  They use a checklist to review each other's stories to make sure that each sentence is capitalized and ends in a period  that each story has a title, and so on.   One group is responsible for collecting the stories each participant submits to include in the scrapbook.  They ask that each participant email Word documents or recordings and they put the stories into a PowerPoint presentation.  One group of low-literate participants collects the pictures and labels them with names and dates.  They record audio captions, too, and put the pictures and captions in the PowerPoint.  One group creates the cover for the scrapbook and the credits page, and oversees the final formatting of the document.  The facilitator gets permission to post the scrapbook on the organization's website so that participants can share their work with their families and friends.
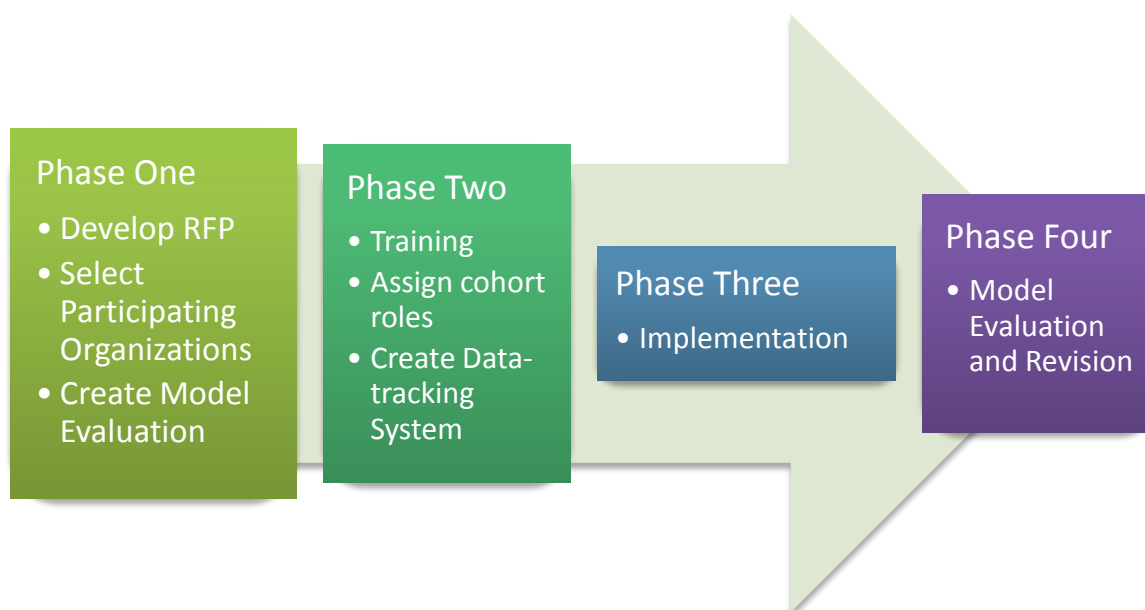
Skills developed:

- basic computing
- reading
- listening
- learning to learn
- brainstorming

- using the internet and email
- writing
- problem-solving
- communication
- creative thinking

- using office software
- speaking
- critical thinking
- teamwork
- giving and receiving feedback

## What is the recommended implementation plan for Project EL/Tech?

Recommendations for implementation of Project EL/Tech are designed for the City of Seattle's Department of Information Technology and the distribution of their Tech Matching Funds. The recommendations are developed out of multiple research activities including: a community needs analysis; a national model review of computer-delivered platforms; a focus group; and research into best practices for integrating English language and technology. Four phases of implementation are explained below, and contain the necessary components that will make the rollout of this model most successful. A checklist of necessary organizational resources and the supports DoIT should provide throughout the four phases summarizes the narrative.

**Phase One**
- Develop RFP
- Select Participating Organizations
- Create Model Evaluation

**Phase Two**
- Training
- Assign cohort roles
- Create Data-tracking System

**Phase Three**
- Implementation

**Phase Four**
- Model Evaluation and Revision

### Phase One

**Develop RFP and Select Participating Organizations**

The City of Seattle's Department of Information Technology distributes Technology Matching funds each year to support Technology Literacy & Access and Civic Engagement projects that reach technology underserved communities. Phase one of implementation should be developing an RFP for technology centers who have interest in implementing a project-based, computer assisted technology and English literacy model. This request should be proposed as a pilot-project to determine the best strategies for integrating technology and English language skills with a computer-assisted model. Organizations that serve the most underserved populations for technology and English language skills are interested in integrating skills, but rarely have the staff resources or knowledge to do so. Therefore, it will be incredibly important that the RFP include funds for staff-release time, stipends for participation, or

hiring a new staff member. The organizational resources required for successful implementation are below, and provide a framework for drafting the RFP and selecting participating organizations.

An important element to the success of this model is collaboration: between ESL and technology instructors; between learners; and between agencies implementing Project EL/Tech. It will be important that collaboration be a key element of this RFP, perhaps through an application process that favors cohort proposals or selection of piloting organizations who are willing to participate in a cohort. Collaboration between organizations who work with similar populations and who are implementing Project EL/Tech will allow the implementation to develop and transform in relation to the individual stakeholders and will increase the capacity of individual organizations. We will refer to the group of selected grantees as a cohort for the remainder of this section.

**Create Evaluation Plan**
DoIT should develop an evaluation plan for measuring the impact of Project EL/Tech. The key questions for the evaluation should be included in the RFP with defined outcomes that will be measured. The goals for the model provide a starting point for developing key questions and outcomes. Aggregate data of all grantees should be compiled in a central location for DoIT to report on the model's impact.

## Phase Two
**Training**
Just as scaffolded support for learners is important, it is also important to provide instructors and organizations with support before and during implementation of a new model. The modularized training plan, in Appendix D, provides an outline of the key competencies necessary for successful implementation. All materials and resources developed and collected in the training phase should be stored in a cloud-based online location for access and reference by the cohort throughout the pilot year and beyond. Training sessions should be recorded and made available for new staff and volunteers. Additionally, it would be most beneficial to the cohort if the training facilitator is the same throughout the pilot year and meets regularly with cohort participants.

**Assign Roles**
If the funds for this project are awarded to a cohort of agencies that have committed to working together for the pilot year, the implementation duties should be dispersed amongst this cohort. These duties can be defined as roles that each person will assume through the pilot year. The benefit of spreading responsibility amongst the group is two-fold. First, it encourages collaboration and cooperation within the cohort and secondly, it addresses organizations' limited staff capacity and time constraints. A representative of DoIT, either existing staff or a new hire, should facilitate and support collaboration throughout the pilot year.

**Purchase data-tracking software, comprehensive assessments, and create a cloud-based content sharing location**
The City of Seattle's DoIT should invest in a shared tracking system that the cohort can use to track learner progress and develop reports. This system can also be used by DoIT to pull aggregate data for program evaluation. Learning assessments, intake forms, and project progress are important to store in a centralized location for all members of an organization to view with ease. With this same system, or an alternate cloud-based system, the cohort should have access to curricular content and materials, and be able to update and share new content. Additionally, if participating organizations are among those without pre- and post-testing instruments, DoIt should purchase comprehensive reading assessments to be shared amongst the cohort.

## Phase Three
**Begin Implementation**
Once organizations are prepared to deliver this model, learners can begin.  For the first few months of implementation the cohort should meet monthly with a DoIT representative and/or the training facilitator, as a learning community, to discuss progress, struggles, and best practices that they encounter during model delivery.  Developing new projects and refining existing projects will be essential during the pilot year and can take place at these meetings or as a separate project-development workshop.  If the latter is the case, requirements for attendance should be explicity stated in the RFP.  Preferably, grantees will create and update projects because they are most aware of their students' needs and interests.  However, this should be facilitated by an expert in project-based curriculum.

Organizations can use their existing software resources and integrate Project EL/Tech into their existing services in a variety of ways depending on organizational structure and capacity:
- An existing ESL or computer class redefined as Project EL/Tech by an interested group of instructors or volunteers
- A new class with a small group of selected participants
- No formal class. Integrate new students into existing project groups and create new groups as projects are completed.  Have Project EL/Tech resources and facilitators available during drop-in lab hours

## Phase Four
**Model Evaluation**
The final phase for implementation of this model should be an evaluation of the pilot year using learner progress data and interviews with staff, volunteers, and students.  Findings should be shared with key stake-holders and used to revise the model and the curriculum, and create strategies for continued implementation and a new RFP.

## Necessary Organizational Resources
In order to successfully implement Project EL/Tech,  organizations will need:
- A computer lab with adequate physical space (at least one computer for every three learners)
- An internet connection
- Microsoft Office software and/or other software already in use within organizations
- Willingness to work with other participating agencies to implement the model and share resources
- Cloud storage or a tracking and content management system for resource sharing and tracking of participant and project outcomes
- Access to or partnerships with organizations who provide support services for participants
- Capacity to provide staff release time for project development and training, including training new staff and volunteers
- Commitment of one or more staff to participate in trainings and act as trainer for new volunteers and staff at their organizations
- Instructors and volunteers who understand how to work with English language learners and with technology
- Competency in at least two of the five training modules in Appendix D before implementation; competency in all five after participating in training

⬜ Pre- and post-assessment instruments

## Department of Information Technology Supports

DoIT can support organizations in implementing Project EL/Tech by:

- Identifying organizations that are interested in participating in a pilot project to implement this model
- Providing funds for organizations who lack any of the items on the checklist above, for example, funds for staff release time, stipends for participation, assessment instruments, and/or hiring new staff
- Facilitating and supporting collaboration between cohort members either through existing DoIT staff or a new hire
- Providing audio and video recording tools for recording training sessions and making them available online
- Providing a professional course designer to design curriculum for the training modules (in Appendix D) and provide support for participating organizations throughout the pilot year in designing project-based curriculum
- Developing an evaluation plan for measuring the impact of this model in its pilot year based on the model goals
- Investing in cloud-based storage or a tracking and content management system that the cohort can use to share resources, review training materials, track learner progress, and generate reports

# Appendix A: Goals and Objectives for Learners

These goals and objectives were adapted from the Missouri Department of Higher Education's Digital Literacy Competencies and the Washington State Adult Learning Standards and Indicators for ESL.  Use these goals and objectives as a framework for designing projects.

| Goals | Objectives |
|---|---|
| This model will provide learners with the opportunity to | Upon completion of this model, learners will be able to |
| 1.  Increase knowledge of basic computing.* | 1.1 List at least 3 different types of personal computers.<br>1.2 Use a keyboard, including function keys, special keys (shortcut keys), number keys and/or ten key.<br>1.3 Demonstrate the functions of the mouse.<br>1.4 Navigate the desktop.<br>1.5 Identify at least five functions of the control panel |
| 2.  Gain an understanding of internet, web, and email use and safety.* | 2.1 Identify at least 3 web browsers.<br>2.2 Compare Internet Service Providers (ISPs) available in the Seattle area.<br>2.3 Identify at least 3 popular search engines.<br>2.4 Define basic web terminology.<br>2.5 Use bookmarking functions in a web browser.<br>2.6 Explain web history.<br>2.7 List privacy and security concerns.<br>2.8 Set up an email account.<br>2.9 Compose emails.<br>2.10    Send emails with attachments.<br>2.11    Receive emails with attachments.<br>2.12    Identify the intended purpose of at least three social    network websites. |
| 3.  Use basic office software.* | 3.1 Launch the appropriate application software.<br>3.2 Create a document.<br>3.3 Create a spreadsheet.<br>3.4 Create a presentation.<br>3.5 Open documents, spreadsheets, and presentations.<br>3.6 Save documents, spreadsheets, and presentations.<br>3.7 Print documents, spreadsheets, and presentations. |

| | |
|---|---|
| | 3.8 Close documents, spreadsheets, and presentations.<br>3.9 Describe the functions of the menus and toolbars.<br>3.10    Copy files to portable external storage drives. |
| 4.   Read with understanding.** | **Literacy**<br>4.1.1  Recognize everyday words or word groups.<br>4.1.2  Demonstrate familiarity with letters and sound/symbol relationships.<br>4.1.3  Demonstrate familiarity with common vocabulary.<br>4.1.4  Locate familiar words in a list.<br>4.1.5  Monitor accuracy of decoding and word recognition using various strategies.<br>4.1.6  Recall prior knowledge to assist in understanding information in simple texts.<br><br>**Low Beginning**<br>4.2.1  Recognize familiar, everyday words in short, simple sentences.<br>4.2.2  Demonstrate familiarity with words.<br>4.2.3  Demonstrate familiarity with simple sentences.<br>4.2.4  Locate important items of information in simplified text.<br>4.2.5  Monitor accuracy of decoding simple sentences using various strategies.<br>4.2.6  Recall prior knowledge to understand information in simple texts.<br><br>**High Beginning**<br>4.3.1  Recognize everyday words in short, simple texts.<br>4.3.2  Demonstrate familiarity with every day content knowledge in simple sentences.<br>4.3.3  Demonstrate familiarity with vocabulary in simple sentences.<br>4.3.4  Locate discrete items of information in texts.<br>4.3.5  Monitor accuracy of decoding and word recognition using various strategies.<br>4.3.6  Enhance comprehension using various strategies.<br>4.3.7  Recall prior knowledge to assist in selecting texts.<br>4.3.8  Recall prior knowledge to assist in understanding information in texts.<br><br>**Low Intermediate**<br>4.4.1  Recognize most everyday and some unfamiliar words in short to medium-length text.<br>4.4.2  Demonstrate familiarity with common, every day content knowledge<br>4.4.3  Demonstrate familiarity with vocabulary related to common, every day content knowledge. |

| | |
|---|---|
| | 4.4.4 Locate important information in simple text using some simple strategies. |
| | 4.4.5 Monitor comprehension by using a range of simple strategies. |
| | 4.4.6 Enhance comprehension by using a range of simple strategies. |
| | 4.4.7 Apply prior knowledge to assist in selecting texts. |
| | 4.4.8 Apply prior knowledge to assist in understanding information in texts. |
| 5. Convey ideas in writing.** | **Literacy**<br>5.1.1 Determine the purpose and audience for communicating in writing.<br>5.1.2 Follow a highly structured plan to organize information about self in very simple structures.<br>5.1.3 Write all letters of the alphabet.<br>5.1.4 Write all numbers.<br>5.1.5  Use simple, everyday, highly familiar words, numbers, and simple phrases to convey information with minimal attention to audience.<br>5.1.6 Recognize the need for revision with support from others to make appropriate changes.<br><br>**Low Beginning**<br>5.2.1 Determine the purpose and audience for communicating in writing.<br>5.2.2 Follow a highly structured plan to organize ideas around self in several sentences.<br>5.2.3 Use every day, familiar vocabulary and simple sentence structures to produce a few sentences on a topic with minimal attention to audience.<br>5.2.4 Make a few simple content changes with intensive support from others.<br><br>**High Beginning**<br>5.3.1 Determine the purpose and audience for communicating in writing.<br>5.3.2 Follow a highly structured plan to organize information about a single familiar topic in very simple structures.<br>5.3.3 Appropriately use every day, familiar vocabulary and simple sentence structures to produce several sentences on a topic with minimal attention to audience.<br>5.3.4 Make a few simple content changes based on review and feedback from others.<br><br>**Low Intermediate**<br>5.4.1 Determine the purpose and audience for communicating in writing.<br>5.4.2 Follow a highly structured plan to organize a limited number of ideas to support a single purpose. |

| | |
|---|---|
| | 5.4.3   Produce a comprehensible draft on a single familiar topic.<br>5.4.4   Use basic text structure to convey an idea with supporting details reflecting some attention to audience.<br>5.4.5   Demonstrate beginning attention to revision strategies. |
| 6.   Speak so that others can understand.** | **Literacy**<br>6.1.1   Use a limited set of learned words and phrases in familiar, predictable, and straightforward communication tasks.<br>6.1.2   Use simple strategies to select and relay information.<br>6.1.3   Apply simple strategies to monitor effectiveness of the communication.<br><br>**Low Beginning**<br>6.2.1   Use a limited set of learned words, phrases, and short sentences in familiar, predictable, and straightforward communication tasks.<br>6.2.2   Use simple strategies to select and relay information.<br>6.2.3   Apply simple strategies to monitor effectiveness of the communication.<br><br>**High Beginning**<br>6.3.1   Use somewhat limited vocabulary.<br>6.3.2   Use basic grammar and sentence structure.<br>6.3.3   Use basic awareness of appropriate level of formality in familiar, predictable communication tasks.<br>6.3.4   Use simple strategies to select and relay information.<br>6.3.5   Apply simple strategies to enhance the effectiveness of the communication.<br><br>**Low Intermediate**<br>6.4.1   Use high-frequency vocabulary.<br>6.4.2   Use knowledge of basic grammar, discourse forms, and sentence structure in familiar communicative tasks.<br>6.4.3   Select from a limited range of strategies to select and relay information.<br>6.4.4   Apply some strategies to enhance effectiveness of the communication. |
| 7.   Listen actively.** | **Literacy**<br>7.1.1   Respond to learned words and phrases in short conversations where the linguistic complexity is considerably simplified.<br>7.1.2   Use a few simple formulas to convey understanding and ask for repetition or |

| | clarification. |
|---|---|
| | 7.1.3 Use non-verbal and visual clues to understand the basic intent of the speaker. |
| | |
| | **Low Beginning** |
| | 7.2.1 Respond to learned words and phrases in short conversations where the linguistic complexity is simplified. |
| | 7.2.2 Use a few simple formulas to convey understanding and ask for repetition or clarification. |
| | 7.2.3 Use at least one simple strategy for gathering missing information and/or repairing problems in communication. |
| | 7.2.4 Use non-verbal and visual clues, as well as background knowledge to understand the basic intent of the speaker. |
| | |
| | **High Beginning** |
| | 7.3.1 Respond to sentence-length utterances and some connected discourse on familiar topics. |
| | 7.3.2 Use several strategies for giving feedback, for gathering missing information and/or for repairing problems in comprehension. |
| | 7.3.3 Apply background knowledge and strategies to understand the intent of the speaker and to respond appropriately. |
| | |
| | **Intermediate** |
| | 7.4.1 Respond in somewhat complex conversations related to familiar tasks and situations. |
| | 7.4.2 Use a range of strategies to repair gaps in understanding, comprehend information, and give feedback. |
| | 7.4.3 Apply background knowledge and strategies to understand details communicated by the speaker and to respond appropriately. |
| 8. Improve process skills: learning to learn; critical thinking; and problem-solving. | 8.1 Identify their own needs. |
| | 8.2 Give and receive feedback. |
| | 8.3 Identify what they've learned from other people. |
| | 8.4 Organize information. |
| | 8.5 Synthesize information. |
| | 8.6 Identify problems. |
| | 8.7 Identify possible solutions to problems. |

| | 8.8 Evaluate possible solutions to aid decision-making. |
|---|---|
| | 8.9 Communicate the problem-solving process. |
| 9.  Connect ideas to real-life contexts to enhance relevance, retention, and transfer of knowledge. | 9.1 Identify ways that technology skills can be used in their lives. |
| | 9.2 Demonstrate understanding of real-life purposes for English language skills. |
| | 9.3 Create relevant materials to meet real-life needs. |

\* Missouri Department of Higher Education's Digital Literacy Competencies

\*\* Washington State Adult Learning Standards

# Appendix B: Sample Assessments

**Assessment of Speaking and Listening Skills**

Student Name: _____

Date: _____

Using this assessment can help you assess your learners' use of speaking and listening, while you are getting to know them further.  Use this assessment *before* and *after* completion of projects.  Score each sentence using the following rubric; then, tally up the total score to be compared at end of project.  This rubric could be applied to any series of questions that are asked to the learner.

| Speaking Rubric | |
|---|---|
| Score | Demonstration of skill |
| 0 | Could not respond. |
| 1 | Responds, but is not correct. |
| 2 | Responds clearly. |

| Listening Rubric | |
|---|---|
| Score | Demonstration of skill |
| 0 | Could not understand question. |
| 1 | Understood part of question, but asked for clarification. |
| 2 | Understood question and responded. |

| Questions | Score | |
|---|---|---|
| | L | S |
| 1. Where are you from? | | |
| 2. Where do you live? | | |
| 3. How many children do you have? | | |
| 4. What is your favorite food? | | |
| 5. Do you have a job? | | |
| 6. Where do you work now? | | |
| 7. Where did you work before? | | |
| 8. What do you do for fun? | | |
| 9. Did you study English before? | | |
| 10. Why do you want to learn English? | | |

**Assessment of Written English Skills**

Student Name: _____

Date: _____

1. Write these words.

   **book**              **cat**              **car**              **watch**

   _____

2. Write these sentences.

   **I want to learn English.**

   _____

   **I want to learn how to use a computer.**

   _____

3. Listen and write the sentence.

   _____

4. Write 5 sentences about the picture.

   

   1. _____

   2. _____

   3. _____

   4. _____

   5. _____

**Assessment of Written English Skills Scoring**

Student Name: _____

Date: _____

Using this assessment can help you assess your learners' writing skills.  Use this assessment *before* and *after* completion of projects.  Score each word and sentence using the following rubric; then, tally up the total score to be compared at end of project.

| Score | Demonstration of skill |
|-------|------------------------|
| 0 | Cannot write, or has significant errors |
| 1 | Satisfactory, but with some errors |
| 2 | The sentence/word is complete and comprehensible |

1. book _____
   cat _____
   car _____
   watch_____

   Total _____/8

2. Sentence 1 _____
   Sentence 2 _____

   Total _____/4

3. Dictate: **I live in Seattle.** _____

   Total _____/2

4. Sentence 1 _____
   Sentence 2 _____
   Sentence 3 _____
   Sentence 4 _____
   Sentence 5 _____

   Total _____/10

   Assessment TOTAL _____/24

**Assessment of Technology Skills**

Student Name: _____

Date: _____

Using this assessment can help you assess your technology skills.  Use this assessment *in the first phases* of a project while the learner is using a computer and *after* completion of projects.  Observe their abilities and ask questions to determine what the learner can already do and what they have learned.

| | Before | | After | |
|---|---|---|---|---|
| | Yes | No | Yes | No |
| 1. List at least three different types of personal computers. | | | | |
| 2. Use a keyboard. | | | | |
| 3. Demonstrate the functions of the mouse. | | | | |
| 4. Navigate the desktop. | | | | |
| 5. Identify at least five functions of the control panel. | | | | |
| 6. Identify at least three web browsers. | | | | |
| 7. Compare Internet Service Providers (ISPs) available in the Seattle area. | | | | |
| 8. Identify at least three popular search engines. | | | | |
| 9. Define basic web terminology. | | | | |
| 10. Use bookmarking functions in a web browser. | | | | |
| 11. Explain web history. | | | | |
| 12. List privacy and security concerns. | | | | |
| 13. Set up an email account. | | | | |
| 14. Compose emails. | | | | |
| 15. Send emails with attachments. | | | | |
| 16. Receive emails with attachments | | | | |
| 17. Identify the intended purpose of at least three social networking sites. | | | | |
| 18. Launch application software. | | | | |
| 19. Create a document. | | | | |
| 20. Create a spreadsheet. | | | | |
| 21. Create a presentation. | | | | |
| 22. Open documents, spreadsheets, and presentations. | | | | |
| 23. Save documents, spreadsheets, and presentations. | | | | |
| 24. Print documents, spreadsheets, and presentations. | | | | |
| 25. Close documents, spreadsheets, and presentations. | | | | |
| 26. Describe the functions of the menus and toolbars. | | | | |
| 27. Copy files to portable external storage drives. | | | | |
| Totals | | | | |

# Assessments of Reading Skills

Reading is complex and shouldn't be assessed solely using comprehension tests. Many assessments have been created to address the four components of reading: alphabetics, fluency, vocabulary, and comprehension. Alphabetics is sometimes called phonics, and it means the relationship of sounds to the symbols of the alphabet. Fluency refers to the rate, ease, and accuracy that a learner reads through a text. Vocabulary is understanding the meanings of words. Comprehension is drawing on knowledge of the topic, vocabulary, and sentence structures to understand the meaning of a text. Listed below are some resources and activities to assess each component of reading. Comprehensive reading assessment programs are available to purchase, and the City of Seattle should provide this option for organizational cohorts using the ESL/Tech Literacy model.

## Alphabetics
LaRue Reading Skills Assessment for Preliterate Students
This test is designed for students who aren't literate in any language. The test is available in three versions, with instructions for scoring and use.

Word Reading Test
This test asks learners to read aloud from lists of words to test their ability to recognize word patterns and sound/symbol relationships. Instructions for administration and scoring are included.

## Fluency
Reading Rate and Accuracy Assessment
This test includes instructions for administering and scoring timed oral reading tests to assess learners' abilities to read smoothly, quickly, and accurately. Don't use this test with preliterate students.

## Vocabulary
There are many vocabulary quizzes online. Pre-assessment for vocabulary is not strictly necessary unless the learner has difficulty with comprehension. It's best to build vocabulary contextually through projects. To assess vocabulary during and after learning, ask comprehension questions, create a crossword puzzle, or create an online quiz.

## Comprehension
Use a reading passage to assess comprehension. Ask oral questions or use written questions to assess what learners understand. Many standardized assessments, such as CASAS, test reading comprehension. Additionally, many comprehension tests are available online, which is a perfect opportunity to simultaneously observe and assess computer skills using the above assessment checklist.

## Comprehensive Reading Assessments
- Comprehensive reading assessments are available to purchase. These assessments provide test materials and scoring for all four components of reading, unlike some standardized assessments that test reading comprehension alone. Recommended comprehensive assessments are:
- Bader Reading and Language Inventory
- Diagnostic Assessment of Reading
- Laubach Way to Reading Diagnostic Inventory

For more information and a comparison chart of published reading assessments, visit LINCS.

## Appendix C: Visual of Project Process

Most educational organizations have established processes for enrolling participants and assigning them to particular programming.  For Project EL/Tech to achieve its intended goals, specified processes should be established prior to implementation at each site.   The visual below provides the recommended process, with key elements for enrolling, delivering, assessing and tracking participant progress.
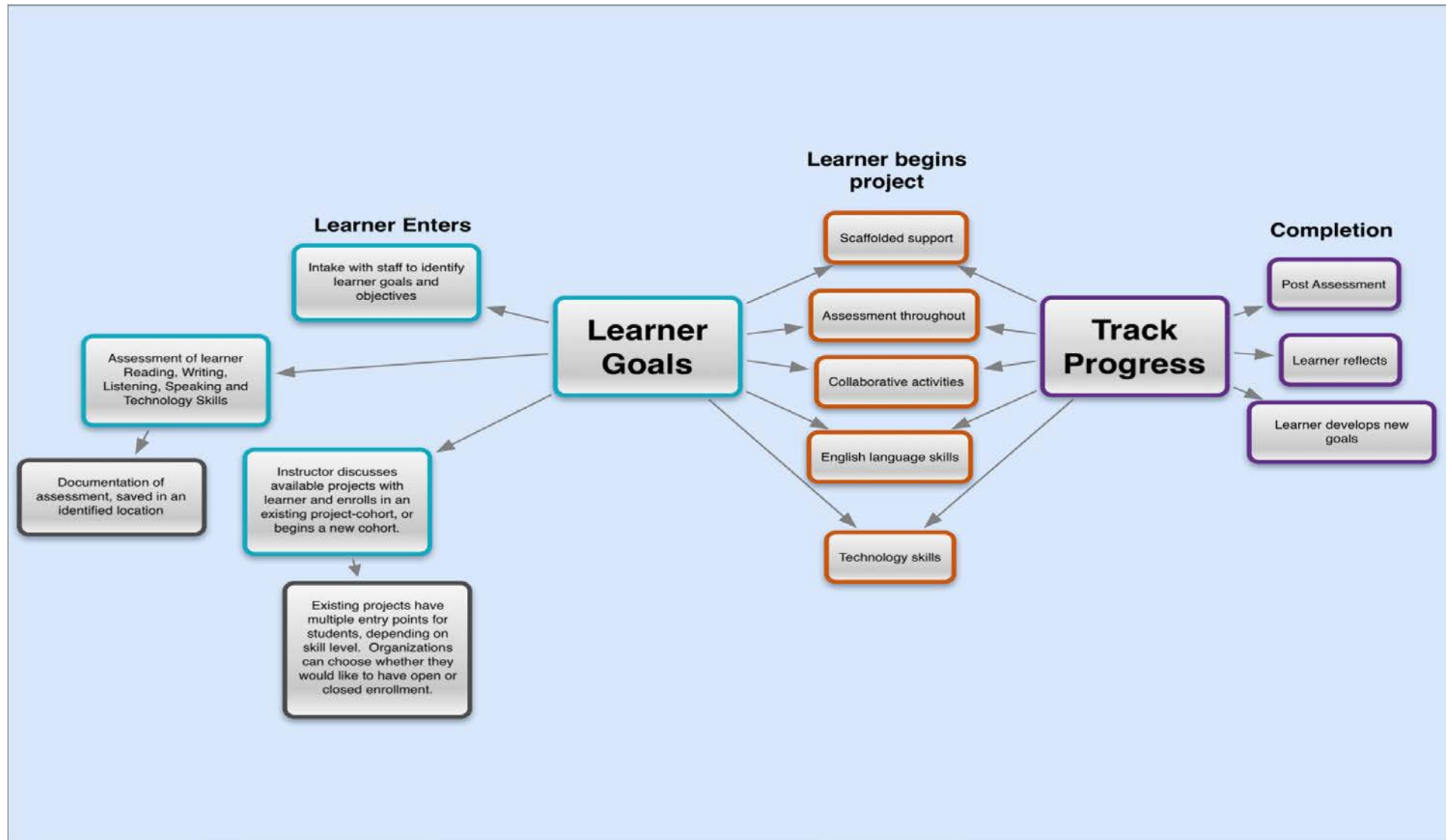
# Appendix D: Training Plan

For Project EL/Tech to be implemented, participating organizations will need to develop critical competencies that are key to implementation. The outline below establishes those critical competencies within five modules. Each module addresses specific goals. These goals are then further identified through the content required in each modules to address the goals. The scope of this current project is to establish a framework for which later professional development can be offered. Therefore, what is included here provides the framework that a later course designer can use to build instruction for participating organizations.

The next step in the design of these modules is that a course designer should write curriculum for each module. That requires establishment of learning objectives, activities and materials, as well as measures of assessment to ensure mastery of the module content. Some of this content will not be needed in every organization; however, the value of modularization is that each organization may select which skills they need to develop. Some of the content should be provided as information only. Other content should be provided through facilitated training sessions. The decision of whether to use facilitated sessions for content will need to be made by the designers in consultation with DoIT staff and organizations that might be selected for pilot participation. It is important, though, that all of the modules are fully developed so that this project is available to the widest possible range of organizations. The resources and materials developed for the training, including recordings of training sessions, should be made available in a cloud-based location so that participants can share knowledge with each other and with new staff and volunteers, and review throughout the pilot year.

## Module 1: The frameworks that support Project EL/Tech
**Goals: Participants within the organization will…**
- Develop knowledge of the frameworks that support the model
- Understand characteristics of adult learners
- Understand how to create equitable learning opportunities for adult learners

**Content in these knowledge areas supports achievement of the above goals.**
- Project-based Learning
- Universal Design for Learning
- Technology competencies
- Washington State Learning Standards for adult English language learners
- Issues of equity and technology
- Contextualized learning
- Adult learning and development
-  The needs of English language learners

## Module 2: Content knowledge in ESL and technology
**Goals: Participants within the organization will…**
- Develop knowledge of teaching English language and technology skills
- Understand the ways that English language, technology, and process skills can be integrated
- Seek out and evaluate resources to support learning

**Content in these knowledge areas supports achievement of the above goals.**
- Teaching English language skills, including literacy
- Teaching technology competencies

- Using necessary software and websites
- Process skills (e.g., learning to learn, critical thinking, and problem solving) and how to integrate into Project-based Learning
- Training volunteers in technology and English language teaching

### Module 3: Course design and assessment

**Goals: Participants within the organization will…**
- Develop skills for planning and implementing project-based learning
- Understand the ways in which they can assess learner progress

**Content in these knowledge areas supports achievement of the above goals.**
- Creating learning goals and objectives
- Developing projects with clear goals and objectives
- Assessing learning with multiple strategies
- Tracking learner progress

### Module 4: Facilitating learning

**Goals: Participants within the organization will…**
- Develop sessions where they facilitate learning for diverse learners
- Understand ways to select and use materials that are consistent with the model goals and goals that the model establishes for learners
- Use a broad range of instructional strategies

**Content in these knowledge areas supports achievement of the above goals.**
- Facilitation vs. instruction
- Working with multi-level groups
- Providing support for adult learners
- Identifying and using appropriate materials
- Using online resources and tools that can help integrate tech and ESL
- Training volunteers to facilitate
- Assessing learner progress

### Module 5: How things fit together to make Project EL/Tech work

**Goals:  Participants within the organization will…**
- Understand employment pathways and their connection to the model
- Develop schema for progressing learners through the model
- Use data effectively to demonstrate program outcomes
- Work with a cohort of participating organizations to advocate for effective programs and services that support adult learners' needs

**Content in these knowledge areas supports achievement of the above goals.**
- Ways that the project prepares participants for employment pathways and further education
- Current and projected employment pathways in the city of Seattle
- Moving a learner through the model framework in organizations with varying capacities and policies
- Using tracked data to provide meaningful information about learner progress toward program outcomes
- The cohort model and possible roles for staff in implementing the cohort model

# Appendix E: Resources for Training and Implementation

**Project-based Learning**
Resources for information about project-based learning and tools for designing and assessing projects.
- Buck Institute for Education
- PBL-Online
- Center for Adult English Language Acquisition

**Universal Design for Learning**
Resources for information about UDL and tools for integrating UDL into curriculum to support all learners.
- CAST – About UDL
- CAST – Learning Tools
- UDL Tech Toolkit

**Adult Learning and Curriculum Development**
Resources for information about model goals and objectives, curriculum frameworks, assessment, and curriculum development.
- Missouri Department of Higher Education's Tech Literacy Competencies
- Washington State Learning Standards and Curriculum Frameworks
- About Classroom Assessment Techniques
- About Language Experience Approach
- LaRue Reading Skills Assessment for Preliterate Students
- Word Reading Test
- Reading Rate and Accuracy Assessment
- LINCS Resource Collection
- LINCS – Comparison of Published Reading Assessments
- ProLiteracy

**Technology Resources**
Local organizations reported that these technology tools and resources are effective for enhancing learning for their students.  While this list does not represent the full range of resources that organizations employ, these are resources that can be incorporated into contextualized projects that allow learners to develop skills by *using* them.

| Software and Online Resources | Technology Tools |
| --- | --- |
| • Camptasia: a screen recorder useful for creating tutorial videos<br>• Google products: Gmail, Google maps, file sharing and storage, document creation<br>• Skype<br>• Websites that serve local users, e.g. DSHS, King County Metro<br>• Weebly: a free, widget-based website creator<br>• WinWay Resume Deluxe | • Projectors<br>• Document cameras that project and record<br>• i-clickers<br>• Digital cameras<br>• Flip cameras<br>• Smart boards |