Contextualized Curriculum

for Adult Learners in Math and Literacy

mccwdta
Massachusetts Community Colleges
& Workforce Development
Transformation Agenda

Translating from Content to Product

Print:

The role of IT business analysts in facilitating communication between technical teams (web developers) and content specialists.

Industry Sector: Information Technology
Content Area: Literacy
Core Topic: Oral communication

Expand All | Collapse All

Common Core State Standards

SL.6.4: Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

SL.11-12.1.c: Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.

SL.11-12.1.d: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

SL.11-12.3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

SL.11-12.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

SL.11-12.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

Adult Basic Education Standards

Oral Communication Standard 1: Learners will speak with ease and confidence for a variety of purposes.

- **OC1.3a:** Elaborate on complex ideas when questioned.

- **OC1.3b:** Express themselves in problematic situations (e.g. advocate for special services for child or self, address supervisor about difficult situation at work).

- **OC1.3c:** Deliver a well-organized oral presentation with consideration of audience, purpose, and the nature of the selected information.

Critical Thinking Standard 1: Learners will solve problems by comprehending, comparing, applying, analyzing, evaluating, and synthesizing information.

Industry Overview

From computer programmers to web developers, and from network administrators to technical support specialists caring for the IT infrastructure, there are information technology (IT) careers available in every sector of the economy. While some people in this field work for IT companies, IT skills and services are needed in fields as wide-ranging as financial services, medical services, biotechnology, engineering and environmental services[1]. The IT industry designs, develops, manages and supports the hardware, software, multimedia and networks we depend on in our daily lives and businesses. IT has revolutionized our world—from the ways we communicate to how we find information to how businesses operate. Job growth in the US IT industry is high and is projected to continue for many occupations within the industry. The field is constantly growing and changing and there are high levels of competition which makes it important for IT workers to keep updating their skills and to understand the latest technologies.

Careers in Information Technology[2]

Information technology careers are divided into four pathways: Network Systems, Information Support and Services, Programming and Software Development, and Web and Digital Communications.

Careers in Network Systems involve network analysis, planning and implementation, including design, installation, maintenance and management of network systems. Examples of network systems occupations include: network administrator, network technician, PC support specialist, telecommunications network technician, data communications analyst, and security administrator.

Careers in Information Support and Services involve IT deployment, including implementing computer systems and software, providing technical assistance, and managing information systems. Successful IT deployment is critical to the success of most organizations—the management and sharing of information depends on non-IT workers having functional computers, software and databases that meet their needs, and support when things aren't working. Information systems and support occupations include database administrator, enterprise systems engineer, help desk specialist, technical support specialist, and technical writer.

Careers in Programming and Software Development involve the design, development, implementation and maintenance of computer systems and software and require knowledge of computer operating systems, programming languages and software development. While many of the career opportunities in this area are in software companies, large organizations of other types—such as financial services— also offer many opportunities. Programming and software development careers include: software applications architect, operating systems designer/engineer, computer programmer, video game developer, applications engineer, and applications developer.

Careers in Web and Digital Communications involve creating, designing and producing interactive multimedia and social media products and services and include development of digitally-generated or

computer-enhanced media used in business, training, entertainment, communications and marketing. Organizations of all types and sizes use digital media (such as the Internet and social media platforms) to communicate with existing and potential customers, to track transactions, and to collaborate with colleagues. Occupations in this pathway include web designer, webmaster, 3D animator, virtual reality specialist, and multimedia producer.

Mathematics and Literacy Skills Needed in Information Technology

The complexity of the IT industry, including the rapid pace of change in technology, requires workers to continuously upgrade their skills. Jobs in this industry require good problem-solving, critical-thinking, and reasoning; clear and professional communication; and a strong background in mathematics. Thus, in addition to technical skills specific to each job, mathematics and literacy skills are crucial for success in all occupations across the industry. Literacy is essential in this field as it is heavily dependent on written and oral communication, and workers need to be able to read, understand, and implement highly-technical content. Workers in this industry must communicate with clients, colleagues, and other departments and staff, including executives.

Regardless of how technologies change, a strong foundation in mathematics, particularly with such core areas as mathematical operations and number sense, measurement and estimation, ratios and proportions, and data analysis is very useful in this industry. For example, programmers and developers must be able to employ quick and competent computation and have the ability to select and apply the best mathematical model or formula to solve problem at hand.

Career Opportunities in IT with Education from Community Colleges

Massachusetts Community Colleges play a crucial role in preparing students for careers in IT across all sectors of the industry. The fifteen community colleges offer associate degree and certificate programs that prepare students to enter occupations across all sectors of the industry, from network administrators to technical support specialists to computer programmers to Web designers. For example, Cape Cod Community College's Department of Business has an IT program that prepares students for a range of positions through both the Information Technology A.S. degree and certifications that offer skills in specific concentrations in this field, such as networking and web design.

Recent Career Opportunities in Massachusetts

The following is a sample of IT job listings in Massachusetts that require associate's degree or certificate:

- Help Desk Technician [show]
- PC Technician [show]

The following is information about hires of recent IT graduates from Massachusetts community colleges:

- Bristol Community College, Computer information Systems: Computer Networks
- Mount Wachusett Community College, Computer Information Systems

Employment Outlook for Information Technology

Given the ubiquity of IT in the U.S. and the world today, employment in this industry continues to boom. Even during the current recession, there has continued to be high demand for workers with good technical, problem-solving and critical-thinking, and communication skills in the IT industry. The U.S. Bureau of Labor Statistics reported in its 2012-13 edition of the Occupational Outlook Handbook that employment in the industry is expected to grow "much faster than the average" of all occupations through 2020. Massachusetts has very high levels of employment and numbers of job openings in many IT occupations across the state. In 2011, it was one of the top seven states for employment opportunities in the industry. Furthermore, Middlesex and Suffolk counties were among the top 20 counties nationally listing IT positions.

However, within the IT industry, job growth and openings vary due to technological changes and competition (especially foreign). For example, employment for computer programmers in Massachusetts and nationally continues to be high, but is declining—future jobs will go to people with

strong technical, cognitive, intrapersonal, and interpersonal skills. Likewise, lower-skilled jobs such as computer support specialists will have lower employment growth due to outsourcing (though help desk personnel are always needed in larger firms to assist non-IT staff with maintenance, troubleshooting, and repair). The highest growth areas in IT—nationally and in Massachusetts—are in such occupations as computer and information systems managers, computer systems analysts, and computer specialists.

Resources

Employment Outlook

- Massachusetts Career Information System
- U.S. Bureau of Labor Statistics: Occupational Outlook Handbook, Computer and Information Technology
- Jobs for the Future: An Examination of the Information Technology Job Market (2012)

Occupational Information

- Massachusetts Career Information System
- U.S. Bureau of Labor Statistics: Occupational Outlook Handbook, Computer and Information Technology
- WorkKeys Occupational Profiles
- WorkKeys: Occupations and Key Skills
- Information Technology Career Clusters
- Information Technology Career Frames

[1]http://www2.edc.org/ewit/materials/ITCCBRO.pdf

[2]As cited in http://www2.edc.org/ewit/materials/ITCCBRO.pdf

Workplace Scenario (8th Grade Level)

This scenario is based on the work of a business analyst. For more information, view this video.

You work as a business analyst in the Information Technology (IT) department. Your company is a publishing firm in the MetroWest area. You support the development of business programs for several projects. You also manage a small team of developers who do the technical work. You work with staff outside the IT department to determine their needs for projects. You are the contact between clients and the technical staff on your team. Your first task is to meet with the clients to identify their needs. You also identify the requirements for product development. Then, you define the needs in technical language for the software developers. You work with the developers to design the product.

Sometimes clients email additional information to you. They often send text, charts, or graphs about their organization. You share the important content with the team of developers to help them understand the task. You are also help work on the design, and you review designs for the user system interface. The interface is the design that allows users to work easily with the software. You are also responsible for managing the test planning and testing. Testing includes creating test scripts that help determine whether the system is working properly. During this time, you stay in constant communication with the client. You must explain all of the technical information to make it clear to non-technical people.

Workplace Scenario (High School Level)

This scenario is based on the work of a business analyst. For more information, view this video.

You are the business analyst in the IT department of a medium-sized publishing firm in the Metrowest area. As a business analyst, you have had several years of experience with this company and three years experience with a previous employer. You have worked at several levels in the industry

beginning as a help desk technician. Your firm develops websites with videos, simulations, and apps. For each new product they launch, they primarily work with staff from the IT department. You are responsible for supporting these website development projects. You also manage the small team of web developers who carry out the technical work. You communicate with staff from the publishing side of the firm to determine what their needs are. You then act as a liaison between these "clients" and the technical staff on your team.

At the beginning of any new development effort, you meet with clients to begin developing a positive relationship with them. You try to determine what their needs are and identify the specifications for product development. You then translate the needs of these content experts into technical language for the web developers. This allows them to develop and deliver products that meet the clients' needs. Throughout the design and development of the product, you are in constant communication with both the client and the technical team members. At times, this process can be challenging. Most of the clients are not well aware of the amount of problem solving that goes into developing these products. The technical staff are usually very knowledgeable about the technical aspects of this work. However, they are often unable to communicate the challenges well in non-technical language. Thus, at times there can be a great deal of tension between the needs of the clients and the technical team. This tension requires you to use thoughtful and clear communication. You also need to be able to listen and respond to the needs of both groups.

Core instructional context

Brainstorm with students why they think communication skills are important in the workplace. Capture these ideas by creating a graphic organizer such as a semantic map. Show the video Communication Skills Are Critical to IT Careers and compare the ideas mentioned in the video with those listed on the semantic map.

If you plan to use the contextual reading about the IT business analyst with your students, use strategies to scaffold the reading (if your students need this type of reading assistance) and guide them to discuss the importance of communication skills for a person in the role of IT business analyst.

Strategies for scaffolding the reading include:

- Motivating students by activating prior knowledge using a KWL chart (Know, Want to know, Learned).
- Identifying and teaching key vocabulary prior to reading or during reading.
- Reading the scenario aloud to students.
- Using graphic organizers after reading to outline text and to illustrate principles within a text, such as a storyboard, story map, character web, time line, Venn diagram, or ranking ladder (Many of these graphic organizers are available at the Holt Interactive Graphic Organizers website).
- Using partner read-alouds.
- Using thinking notes while reading (View the Teaching Channel's video on Thinking Notes).

Point out that speaking and listening are at the heart of much human interaction and good communication skills are an important aspect of employability in most professions. Someone working with clients must listen carefully to identify the clients' wishes and needs, and they must also be able to translate that information to their colleagues and staff. Poor listening skills may lead to missing key pieces of information, and poor speaking skills will lead to others not fully understanding their tasks.

Adults typically view speaking and listening as areas of strength because of the level of experience they bring to these activities. They may be used to speaking with ease and confidence and reporting information in a logical sequence. The more challenging aspects of speaking and listening are related to their previous experiences since many adults must unlearn poor habits in both areas. Speaking and listening are skills we learn in the first year of life, which means that each individual may have spent a lifetime learning poor habits that must be unlearned. For example, few adults listen attentively enough to be able to fully comprehend, analyze and synthesize what they have heard and to recall and apply it later in critical situations. In addition, most adults have learned poor speaking habits that need to be replaced with good ones, including the use of filler words or phrases or using nonstandard language in formal situations such as working with clients, colleagues or staff. Since speaking and listening skills

are so important in information technology, IT staff must develop these skills to do their jobs effectively. Fortunately, these are skills that can be improved with practice.

Poor listening skills contribute to poor comprehension and the ability to apply knowledge. In order to comprehend, analyze and synthesize information, students must listen effectively.

A good listener uses the following techniques

- maintaining eye contact with the speaker.
- avoiding distractions in the surroundings.
- avoiding interrupting.
- sitting or standing still.
- nodding his or her head or using other nonverbal cues to show understanding.
- maintaining focus by avoiding internal distractions or thoughts.
- taking brief notes.
- listening for subtext while testing assumptions.
- testing his or her understanding by repeating instructions or key details.
- asking clarifying or other appropriate questions when the speaker has finished.

Good speaking skills are critical to good communication and require the speaker to organize his or her thoughts before speaking. Good speakers ask themselves:

- Who is the audience?
- What vocabulary is appropriate for the audience?
- What is my goal?
- What are the important details that I need to share?
- What is the most logical sequence?

A good speaker:

- organizes his or her thoughts before speaking.
- uses clear and concise language without including extraneous information.
- delivers main ideas and supporting details in a logical sequence.
- speaks clearly and practices good enunciation.
- uses correct pronunciation.
- uses correct standard English.
- uses appropriate volume – speaks neither too loudly nor too softly for the environment.
- speaks confidently and avoids filler sounds, words or phrases.
- maintains appropriate level of eye contact with the listener.

Critical thinking is supported by good listening skills that enable the listener to comprehend new information, to compare or contrast what is being heard to similar situations in order to deepen comprehension, to apply the new information, and analyze or evaluate situations or information. Critical thinking skills enhance the learner's ability to organize his or her thoughts before speaking.

Example Activity

Organize students into groups of three or four, where one student is given a piece of blank paper and is designated as the artist who will draw an image based on verbal instructions from the rest of the group who are viewing a picture of the image. The object can be a geometric shape or other easily replicated image. Group members can take turns being the artist using different images for each turn. Alternately, the instructor can give the directions as students draw at their seats. At the end of the activity, the instructor leads a class discussion to debrief why groups were or were not successful in replicating the images. Help students identify how listening and speaking skills helped them in the process of replicating the image.

The previous activity can lead into one based more closely on the scenario in this module. If students need more information about careers in information technology, you might show this short video about careers in Computer and Data Processing.

Tell students that they will use role-playing to practice their listening, speaking and critical thinking skills. Describe the small group task and review the scenario about the IT business analyst in this

module. Work with students to build or review the rubric to be used to assess or self-assess their role-playing performances. Peers might also use the rubric to assess their classmates.

Organize students into groups of three and ask them to imagine one student is the client, one is the IT business analyst in the scenario in this module, and one is a member of the IT staff. Students should read the scenario provided, and discuss their ideas for the role-play activity. The student playing the IT business analyst will listen to the client who wants his firm to develop a website for her company and who has definite ideas about content, colors and layout. The student playing the IT business analyst will then translate what the client wants to the student playing a member of the IT staff. Ask students to improvise a role-playing activity to share with the class. To help students plan, remind them to listen carefully and make notes about specific information they should remember in order to share it with the IT staff. Ask the student playing the IT business analyst to remember to organize the information so that it makes sense and there are no misunderstandings about what the client has expressed. Tell students to write out their thoughts and practice what they will say aloud with until they are confident in delivering the information. Remind students that they should not memorize what they will say since they will be unlikely to have time to do this on the job. When students are ready, they can create a podcast if technology is available or a video using their cell phones of their role-play. If not, they can demonstrate their role-play to the class. Remind them to pay attention to the attributes in the assessment rubric.

Assessment

A rubric is a good assessment strategy to provide feedback for performance-based activities. The rubric can be used to assign a grade, for self-assessment or for peer assessment. Use a rubric developed through discussion with your class, one you normally use in your course or your department, or one you adapt from a rubric on Internet such as one of these:

- Informal Speaking and Listening Rubric, Nelson Education Ltd.
- Oral Presentation Rubric, ReadWriteThink
- Oral Communication VALUE Rubric, American Association of Colleges and Universities
- Oral Communication Rubric, Piedmont Community College

Contextualized learning activities

1. Assign an activity that requires students to communicate the same information in two different ways. Start with a topic that students know well (i.e. how to drive a car with a standard shift, how to play a particular sport or how to play a particular video game). Tell them they will present information about that topic to an audience who already know something about the topic and to a beginner audience who are completely new to the topic. Remind them to think about the difference in language and presentation for each audience. Point out that considering the audience is a specific skill in communication and that it would be particularly important in an IT scenario where they might need to present a solution to a problem to a "client" in comparison to presenting the same information to the tech team.

2. Ask students if they are familiar with the word "jargon." Provide a few examples and ask if students know of others. Define the word. If students are not able to define the word, watch one of the videos Leaderskilz – Keep it Simple or Technical Jargon! to help them generate some ideas. Identify some of the phrases and words that would be considered jargon. Ask students to try to translate what the sales team in the first video is trying to say. What do they think would happen if the IT business analyst in the scenario in this module spoke to clients in this manner? How does jargon get in the way of effective communication?

3. Invite a representative from the campus IT department into the class to talk about their work. After the representative makes a short talk about the work of the IT department, students will interview the person and learn more specifically how oral communication is used in a daily way within the industry. Be sure that students have organized their thoughts and prepared questions ahead of time. Remind them to listen carefully to the IT representative so that they do not ask a question that has already been answered. Remind them also to take notes to be sure they have heard and understood the information.

4. Ask students to interview someone who works in the information industry about how they use communication in their jobs. If they will interview tech team members in the local organization, you might want to assign small groups to do this to avoid using too much of the tech team's time. Remind students to organize their thoughts and develop questions ahead of time.

5. Ask students to reflect on a time they have asked for technical support for their own computers or other devices. Assign small groups of students to share these experiences making a tech support call. If only a few students have this kind of experience, assign groups so that at least one person with such experience is in each group. Student groups will discuss the qualities of oral communication that were helpful and such questions as whether it makes a difference if the help desk person has an accent or used technical jargon. The groups should develop a list ways communication was effective and ways it was not effective during these calls.

6. Direct students to view each of these videos and take notes to discuss in groups in class. Alternately you can use a jigsaw technique by dividing the class into five groups. Have each group watch one of the videos and prepare a summary of the listening or speaking strategies mentioned in the video and to be prepared to share with the class.

- Verbal Communication Skills for IT Analysts - Part 1 of 5
- What multi-tasking means to IT Analysts - Part 2 of 5
- Business Requirements Gathering - Part 3 of 5
- How to Tell a Developer You Found a Defect - Part 4 of 5
- How to Tell Your manager You Can't Take on Another Project - Part 5 of 5

Contextualized test items

Students will create a video or recording of their explanation to other students or an adult they know about how to create a Google doc, save a document to a particular folder on the computer or complete some other technical task. Remind them to use courteous, non-condescending, clear language. Students will submit the video or recording with a copy of their self-assessment using the performance rubric for assessment provided by the instructor.

Contextualized project

Provide or develop a case study about a specific client, providing specifics and details about the company such as this sample:

Aascan Company is a construction firm specializing in building homes for families. They are opening a new area for custom built homes in a park-like setting around a lake. The size of each home lot will cover about half an acre with many trees left standing. In order to generate interest in the business and to attract clients, Aascan wants to create a website that shows photos of the site, drawings of homes that might be built on the site and information about the homes and the location. An Aascan Company representative will meet with you and your IT company's business analyst to discuss Aascan's website design. After meeting with the Aascan Company representative, you will provide the information to your web development team.

Divide students in pairs or groups of three to develop a plan to meet the client's needs and to role-play the Aascan company representative, the IT company business analyst, and a web development team member. The pairs or groups will discuss the client's needs in order to develop a plan for the client's company. Remind students to apply good listening and speaking skills as they role-play. If they present to the class, members of the class can provide a peer-assessment using the performance rubric. The pair or group might also video themselves during the role-play and complete a self-assessment using the same rubric.

Additional or extension activities, multimedia, readings and/or resources

[Career One Stop, U.S. Department of Labor](#): Career information

[Massachusetts Career Information System](#): Careers are presented regionally in terms of wages, etc.

[Occupational Profiles, Work Keys](#): A good source of samples of different levels of reading and writing for various careers and it is also linked to adult basic education (ABE)

[IT System Manager, O*Net Online](#): Contains additional job information for the scenario in this module

[Poor Communication Leads to Inadequate Workplaces, Anonymous Employee](#): Article about the importance of communication

Instructor Adapted Classroom Materials

[Translating from Content to Product Lesson Plan,](#) Middlesex Community College, ABE/GED

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