Instructional Design Project

Ohio Assessment for Educators Computer/Technology Endorsement

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Introduction

For the Instructional Design project, the Cyber Tigers team chose the Ohio Assessment for Educators Computer/Technology Endorsement problem with Dr. Cheryl Ward as the subject matter expert (SME). Currently, in order to receive the technology endorsement, candidates are required to take the Ohio Assessment for Educators (OAE) which covers Computer/Technology. This endorsement is new as of December 2013. The team used the ADDIE model to develop a learning tool that would align with the goals of the project.

Cyber Tigers consists of Ruth Fingerhut, Becky Reiter, Diane Richardson, Esther Wain-Weiss, and Katie White, all students in the Instructional Technology Program at the University of Akron. The team had a strong desire to work on this problem since it relates to all students in the Instructional Technology program. Members of the Cyber Tigers team have a minimum of 5 years teaching experience and a maximum of 25 years. This experience includes public, private, elementary, middle-level, secondary, post-secondary, general, and special education settings. The team also consists of master teachers, distinguished educators, and highly qualified teachers. Each of the team members possesses or is working towards a master's degree. The Cyber Tigers team is currently completing coursework in the Instructional Technology Program at the University of Akron.

Analysis Phase

Introduction to the Learning Situation

The Ohio Assessment for Educators Computer/Technology Endorsement project was sought by Dr. Cheryl Ward, associate professor in the Educational Foundations and Leadership Department at the University of Akron. Beginning in December 2013, students completing the K-12
Computer/Technology curriculum will be required to take an Ohio Assessment for Educators covering the content in order to receive the Computer/Technology endorsement on their Ohio teaching certificate. The endorsement allows candidates to obtain positions within a school district as a technology integration mentor or facilitator. The assessment for the endorsement is divided into two subtests which cover three major domain areas. The domain areas for Subtest I include Basic Operations, Concepts, and Issues of Digital Technology, as well as Productivity Applications of Digital Technology. For Subtest II, candidates are required to know information from the Teaching and Learning Applications of Digital Technology domain.

**Identification of the Learning Problem**

In order to obtain a position as a technology facilitator within a school district, candidates must have a passing score on the endorsement assessment. However, the candidates lack the necessary skills in reference to the domains of basic operations, concepts, and issues of digital technology and productivity applications of digital technology. The candidates also lack awareness related to accessing appropriate resources to practice and register for the assessment, as well as an understanding of the processes to complete the assessment to ensure their endorsement is certified in a timely manner allowing them to obtain employment as a K-12 Computer/Technology educator.

**Statement of the Learning Goal**

The learning goal is to provide a readily accessible online learning module with two parts that will efficiently prepare candidates for the Computer/Technology Assessment (Subtests I and II). The first portion of the learning module would provide general information about the endorsement and also completing the test. The second part would include a learning module that provides a review of the necessary content knowledge and a practice assessment. The sub-goals consist of helping students to understand the requirement associated with the Ohio Assessment for Educators; identifying the name of
the required test; understanding the competencies of the assessment; and preparing an assessment framework for the University of Akron Instructional Technology classes to show gaps between what is being taught and what is being assessed on the Computer/Technology Assessment (Subtests I and II).

**Detailed Needs Analysis**

A needs assessment was created in the form of a survey that was e-mailed to all students who are currently enrolled in the Instructional Technology Master’s Program at the University of Akron. The survey questions were directly related to the domain standards of the Computer/Technology Endorsement Assessment. The sample size consisted of fourteen current students of the Instructional Technology program.

A meeting with the subject matter expert, Dr. Ward, was scheduled in order to find “gaps” in the current curriculum of the Instructional Technology Master’s Program at the University of Akron. A curriculum alignment document was then created.

After analyzing the results from the candidate surveys, it was found that there is a need for instruction related to hardware and software best practices as well as health and safety related issues of technology use. The candidate surveys also indicated a need for instruction for virus protection, use of online databases and subscriptions, and internet safety and privacy policies. Due to gaps between the OAE standards and coursework taught at The University of Akron as noted by the curriculum alignment assessment, there is a need for instruction related to virus protection, online databases and subscriptions, and Internet safety and privacy.

According to the SME, candidates also lack the knowledge of how to access the Ohio Assessments for Educators website to locate information related to registering for testing dates and sites and practice materials designed to prepare candidates for the Computer/Technology Assessment.
(Subtests I and II). Therefore, a need for instruction in the form of short tutorial videos and learning presentations for navigating this website was established.

**Detailed Learner Analysis**

The learners for this project include past students and current students completing the coursework in the Instructional Technology Program through the College of Education at the University of Akron. The Instructional Technology program is a graduate level program, so students are typically over the age of 22, of both genders, and have a variety of ethnic and cultural backgrounds. All learners have bachelor’s degrees and varied work experiences. Although the majority of the students are currently employed in educational fields, a few are employed in non profit organizations, self employed, or seeking positions. Some are seeking a Master’s Degree in Instructional Technology, while some are seeking the Instructional Technology Endorsement to add to their current certificate or license.

**Design Phase**

**Content Analysis**

After evaluating the results from the needs analysis and learner analysis, the *Cyber Tigers* team chose to create a website for the sole purpose of housing all of the required information to prepare candidates for the endorsement assessment. The content included on the *Computer/Technology Endorsement Council* website is diverse and comprehensive. The *Project Overview* includes content based upon the ADDIE process that the team used to provide a solution to the instructional problem. The *Data Analysis* section summarizes pre and post-survey data, as well as feedback received from site users. The *Resources* section includes the following subpages: Informational Literacy, Computer Basics, Troubleshooting, Computer Viruses, Health Related Concerns, Ethic/Legal,
Privacy, Safety, the Digital Millenium Copyright Act, the TEACH Act, CIPA, and FERPA. These resources are aimed strictly at the domains of the endorsement assessment. Each subpage includes general information about the content and also links to websites that allow candidates the opportunity to gain further information related to the content. The Tutorials section was designed to teach candidates how to access and navigate the Ohio Assessment for Educators (OAE) portion of the Ohio Department of Education (ODE) website. Through a Jing video the tutorial also provides information about how to register for the Computer/Technology Endorsement assessment and determine when the assessment results will be received. Visitors to the site are also able to take quizzes in the Test Your Knowledge section which assesses information from the resource section. The site is designed to provide options for self selected study based on the users’ individual profiles and needs. Lastly, the Evaluation section presents a detailed analysis of feedback, survey results, and updates made as a result of site users’ comments.

Site Organization and Navigation

The Computer/Technology Endorsement Council website is organized into seven main sections and twenty-three subsections. Visual representation includes Prezi presentations, interactive quizzes, videos, and diagrams to assist with comprehension.

Visitors to the site will navigate easily via a main navigation bar with multiple drop down menus organized by key ideas. All pages open in individual windows and can be easily closed to return to the main page. All main pages provide a link to all other main pages.

Site Conventions

The site was designed with a white background and a neutral, black font. The smallest font used was size 14. All pages used Tahoma and Fredericka the Great, both easily readable. Images
represented either the academic background of the team - The University of Akron and/or the content of the website. Blue and yellow accents also represented the academic background of the developers. The site is attractive and visually pleasing.

**Formats/Media**

Diverse document types add variety to the site. Prezis add both a visual component and an auditory component with the embedded Jing screencast videos. The site also offers visitors the opportunity to take interactive quizzes with feedback. Several PDF documents are included in the *Resources* section. A combination of varied document types offers the visitor an interactive, adaptive experience that should meet the candidate’s educational needs.

**Development Phase**

**Media Selection Rationale**

With the amount of information that the candidates need in order to pass the Computer/Technology Endorsement (Subtests I and II) assessment, the *Cyber Tigers* agreed that a website would be best for all users because it would be a flexible and user-friendly platform for organizing all of the information needed. Another reason a website will best serve the needs of the learners is that most of the candidates who are preparing to take the endorsement are technologically familiar with website platforms. The team chose to keep the format similar to give the best results. The platform WIX, which is a free website builder, was chosen because it was customizable to the needs of the group, as well as the candidates. The simple website editor and design feature of WIX allowed the team to add organized subpages of information as well as information from other types of platforms onto the website. With the use of the organized subpages, candidates can navigate easily through the
resources that they need as they prepare for the assessment.

As stated by the SME, the Ohio Assessment for Educators website often presents a challenge to candidates who want to prepare and register for the endorsement. The website is difficult to navigate as the site is not specifically aimed at only the Computer/Technology Endorsement assessment, but rather all types of assessments for other endorsements. Therefore, the Cyber Tigers group utilized a Prezi, which is an online presentation similar to Microsoft PowerPoint, to help get information specifically related to the K-12 Computer/Technology Endorsement (Subtests I and II) assessment to the candidates in an organized fashion. Rather than just providing the link to the OAE website, the team felt it was necessary to break down the information into a detailed slideshow. The slideshow provides the website address, screenshots of the website, as well as sound recordings done by the Cyber Tigers team to give more information. Within the Prezi, Cyber Tigers also used Jing videos to demonstrate how to access the website and all of its necessary contents. A Jing video allowed the Cyber Tigers members to record their computer screen with auditory directions to demonstrate and teach candidates how to access the different parts of the OAE website. Instead of typing up a set of directions for candidates to print off, most candidates would prefer to watch a “how to” video so that they can learn how to complete the necessary tasks.

Lastly, the Cyber Tigers found that the OAE website did provide practice materials for candidates to use in order to prepare for the assessment. However, the team found that the materials lacked the necessary scope of the competencies required and did not meet the training needs of the candidates for each competency. The team, therefore, designed interactive online quizzes to test the understanding of the candidates. The platform used for the online quizzes was Quiz Revolution, which was easily navigable and allowed the team to embed the quizzes onto the website.
Issues of Message Design

It was important to the Cyber Tigers team to create a welcoming, user-friendly, and easily navigable website for those candidates interested in obtaining the endorsement through the practice and use of the website. Therefore, to provide a welcoming and comfortable feeling, the color scheme was chosen as blue and gold to represent The University of Akron, as most candidates utilizing the site will have had a history with the university. The chosen images, including the seal of the university, Zips emblem, and a Student Union photograph to create a sense of comfort as the students will mentally recognize these graphics. Next, the navigational buttons of the website were placed in a logical order and the information for each section was divided into related sections. With so much information to present to the candidates, the divided resources and tabs allow candidates an easy way to navigate through for the resources they need as well as providing a clean and organized look to the website. Reading from left to right, the navigational buttons take the user through a process that begins with the background about the Computer/Technology Endorsement Council, then moves along to the ADDIE Prezi which gives background information about why the website came about and the data to support the design of the website. The next navigational buttons are resources that students can learn the necessary information from, followed by the tutorials about accessing the website, and finally quizzes that assess the knowledge gained by the candidate from the website. For these three navigational tabs, the logic behind their order relates back to classroom teachings: provide access and time to learn the information, followed by visual examples on accessing the information, and finally assessing the learner over the information through the use of formal quizzes.

Informational Resources
To present the information to the candidates, the team used Prezis and Jing videos. For the “Resources” section, the information came from a variety of websites that focused on the needed content information. For the “Informational Literacy” subpage, the focus is on using the database ERIC, evaluating sources, and finding electronic resources. The Computer Basics page includes information on computers, operating systems, and common terminology. On the “Troubleshooting” subpage, the content includes links to common computer problems and their solutions that many computer users encounter. Next, the Computer Virus section provides a link to the United States Computer Emergency Readiness Team in which the candidate can answers to commonly asked questions about computer viruses. The University of Pennsylvania, Environmental Health & Radiation Safety provides information that allows candidates to familiarize themselves with the technology health related concerns on the Health Related Concerns subpage. Due to the abundant information related to the legal, ethical, privacy, and safety information, the subpages including Ethical/Legal, Privacy, Safety, DCMA, TEACH, CIPA, and FERPA pages to provide content from different sources. These resources include portable document formats of all of the laws, acts, and information necessary to understand this domain.

Functional Website

The website is titled Computer/Technology Endorsement Council and can be found at the following link: http://rsr203.wix.com/computertechnology-endorsement-council. Prior to publishing the website, the Cyber Tigers reviewed the content, the Prezis, working links, Jing videos, graphics, and audio in order to make sure all candidates were able to access everything no matter what type of computer or technology they were using. Once all content was checked, the team focused on editing
the mechanics, grammar, spelling, and punctuation of the website in order to avoid any lack of continuity.

Assessment Plan

In order to assess the learning of the candidates over the information from the website, Cyber Tigers used a pre-survey and a post-survey. The candidates took the pre-survey before the team developed the website in order to meet the needs of the learners. Once the website was published and released, candidates were asked to go through all of the information on the website. Once they completed the walk-through of the website, candidates were required to complete the post-survey to assess what they had learned with the help of the learning module website. In the post-survey, an added comment box was at the end of the survey for candidates to make recommendations, comments, or suggestions that will aid in the overall design and information on the website. Cyber Tigers then compared the results from both surveys in order to assess the areas of weakness from the students and the websites, thus making adjustments that were found necessary. Along with the survey comments, the team also used the Cyber Tigers wiki page to assess the overall usefulness of the website and its content. Using this feedback, the team adjusted and updated the website as was necessary.

Implementation Phase

Implementation of the Project with a Target Audience

At the final meeting before the team implemented the website and survey, the focus of the face to face meeting was finalizing the website as well as determining deadlines for the implementation. The website was published later that day and an email was sent out to students who were currently enrolled in the Instructional Design program at The University of Akron. The audience consisted primarily of
graduate students enrolled in the Instructional Technology Master's Degree program at The University of Akron. The respondents also had an interest in completing the assessment for the Computer/Technology Endorsement (Subtests I and II). Of those students who were emailed, a total of fifteen candidates then completed an online survey through SurveyMonkey.com related to the domains of the endorsement assessment.

**Description of Implementation Timeline**

On March 12, 2014, the council sent out an email to ask current graduate students of the Instructional Technology Master's Degree program to participate in a learning survey based on the domains of the Computer/Technology K-12 Endorsement assessment. Using the results from the pre-survey, the *Cyber Tigers* team formed the website to help the candidates. Then, on April 13, 2014, the council sent out an email to those participants from the original survey to introduce the launch of the website, *Computer/Technology Endorsement Council*. Also, a final survey was included in the email for the evaluation of the project to be completed by the candidates. Also on April 13, 2014, the *Computer/Technology Endorsement Council* website was launched. Participants of the survey were asked to navigate through the website and resources. After utilizing the website, candidates were asked to complete a final survey to evaluate the strengths and weaknesses of the website as well as their learning from the website. On April 17, 2014, an email reminder was sent out to candidates about the website and the evaluation survey in order to gather additional feedback. On April 21, 2014, the *Cyber Tigers* team asked Dr. Ward to promote the website and survey to members of the Instructional Design team because there was a lack of participant post-survey results. Finally on April 22, 2014, a thank you email was sent to all participants who completed the website walk through and evaluation survey. The council began analyzing the results from the final survey and addressing areas of concern.
Description of Implementation Process

Ideally, the Cyber Tigers team would have preferred matching pre-survey results of individual candidates to post-survey results for those specific candidates, the anonymity that was offered to participants in the survey did not afford us that opportunity. In addition, the team wanted to encourage as much participation as possible and to seek feedback from as many candidates as could use the site. Limiting the implementation to only those candidates who began with the pre-survey, would have restricted participation in the broader goal, which was to have users benefit from and comment on the Computer/Technology Endorsement Council website. In all, twenty one candidates completed the post-survey, and respondents reflected increased confidence in the standards addressed on the website. Comments posted by participants indicated that they felt the need for a resource to assist in preparing for the Ohio Assessment for Educators and that they were able to use the website for guidance in understanding the demands of the exam as well as resources for self study to address identified gaps in knowledge. Most commented that the site was very helpful.

Recommendations for Changes

The Cyber Tigers team would have benefitted from expertise in overall graphic design as it pertains to website visuals, color schemes, fonts and balance. The expertise of the team leaned heavily toward content, with skills in utilizing various platforms and tools for educational goals. The scope of this project with the time limits imposed by the course did not provide for the time to examine the website from a purely design view. In a real world setting and timeline, retaining a consultant versed in web graphics would be a next step in upgrading the overall look of the website. In the world of educational technology, providers of services for designing specialized products and services for educators are increasingly involved as partners in the creation of educational technology services.
New tools which improve the aesthetics of teacher created resources continue to emerge as well, making it possible to leverage design resources without specific design expertise.

**Evaluation Phase**

**Implementation of Evaluation Plan**

The target audience was the population of graduate students enrolled in programs culminating in the Computer Technology Endorsement which requires passing the Ohio Assessment for Educators Computer/Technology Assessment (Subtests I and II). All students on the Class List with University of Akron email addresses were included in the invitation to participate in the initial survey, the trial of the Computer/Technology Endorsement Council website and the post-survey. Of those invited, 21 individuals participated. The implementation took place via the University of Akron email and website links provided to the Computer/Technology Endorsement Council website and the skill assessment.

**Collection of Formative Evaluation Data**

Data included pre-survey and post-survey results. It is assumed that candidates will continue preparation efforts past the conclusion date of this project timeline, as the site will remain operational. Candidates may choose to revisit the tutorials on this website until they take the Ohio Assessment for Educators. Both of the surveys were delivered via Survey Monkey. Pre-survey data was able to identify areas of greatest need for bridging gaps in knowledge and directed the choices made by the Cyber Tigers team in organizing instructional resources. Post-survey data identified areas of growth in target areas. All candidate training efforts prior to taking the Ohio Educator Assessment is considered to be formative assessments as the summative assessment is the OAE.

**Assessment and Interpretation of Formative Evaluation**
In order to establish the needs of the learners, the council utilized the results from the pre-survey that candidates took. To target the areas of need, the council determined that any area that totaled 50% or more in the “No, I don’t know how to do this” response column was to be a focus for the website.

The areas of need include the following:

- Demonstrating kinds and functions of hardware and software
- Demonstrating knowledge of viruses and methods for virus prevention
- Completing basic troubleshooting procedures for identifying hardware, software, and connectivity problems
- Understand and use appropriate terminology to articulate information relating to hardware, software, and connectivity problems
- Demonstrating knowledge of the scope and jurisdiction of local acceptable use policies (AUPs) and state and federal laws relating to use of digital technology
- Demonstrating an understanding of how to use digital technology responsibly with regard to student, guardian, and school staff privacy and security (e.g., Children’s Internet Protection Act of 2000)
- Demonstrating knowledge of the legal requirement for obtaining proper consent in compliance with local policies for electronically producing, publishing, sharing, and distributing student, guardian, and school staff information (e.g., names, photographs, student work)
- Demonstrating an understanding of health issues related to the use of digital technology

The website that contained all target areas was then released to the candidates. After the implementation of the website, candidates were asked to complete a post-survey which had the candidates re-evaluate their knowledge of the target areas after completing a walk through of the
website. Results showed a significant improvement in all of the target areas, with many of the areas resulting in 100% competency. Below is a table to show the improvement from the pre-survey to the post-survey.

## Pre-Survey and Post Survey Data

<table>
<thead>
<tr>
<th>Standard 001</th>
<th>Yes Pre-survey</th>
<th>Yes Post-survey</th>
<th>No/Don’t know Pre-survey</th>
<th>No/Don’t know Post-survey</th>
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</thead>
<tbody>
<tr>
<td>Are you able to demonstrate knowledge of kinds and functions of hardware and software?</td>
<td>50</td>
<td>100</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Are you able to demonstrate knowledge about viruses and methods for virus prevention?</td>
<td>21</td>
<td>90</td>
<td>78</td>
<td>10</td>
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<tr>
<td>Standard 002</td>
<td>Yes Pre-survey</td>
<td>Yes Post-survey</td>
<td>No/Don’t know Pre-survey</td>
<td>No/Don’t know Post-survey</td>
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<td>Are you able to complete basic troubleshooting procedures for identifying hardware, software and connectivity problems?</td>
<td>43</td>
<td>95</td>
<td>57</td>
<td>5</td>
</tr>
<tr>
<td>Are you able to use appropriate terminology to articulate information relating to hardware, software and connectivity problems?</td>
<td>29</td>
<td>95</td>
<td>71</td>
<td>5</td>
</tr>
<tr>
<td>Are you able to demonstrate knowledge of the scope and jurisdiction of local acceptable use policies and state and federal laws relating to use of digital technology?</td>
<td>38</td>
<td>94</td>
<td>61</td>
<td>6</td>
</tr>
<tr>
<td>Are you able to demonstrate knowledge of best practices regarding computer and security concerns and shared resource management?</td>
<td>23</td>
<td>89</td>
<td>77</td>
<td>11</td>
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<tr>
<td>Question</td>
<td>Pre-survey</td>
<td>Post-survey</td>
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<td>No/Don’t know Post-survey</td>
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<tr>
<td>-------------------------------------------------------------------------</td>
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<td>---------------------------</td>
</tr>
<tr>
<td>Are you able to demonstrate an understanding of how to use digital tech. responsibly with regard to student, guardian and school staff privacy and security? (CIPA 2000)</td>
<td>46</td>
<td>94</td>
<td>54</td>
<td>6</td>
</tr>
<tr>
<td>Are you able to demonstrate knowledge of the legal requirement for obtaining proper consent in compliance with local policies for electronically producing, publishing, sharing and distributing student, guardian and school staff information?</td>
<td>46</td>
<td>100</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>Are you able to demonstrate health issues related to the use of digital technology?</td>
<td>46</td>
<td>100</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td><strong>Domain II-Productivity</strong>&lt;br&gt;<strong>Applications of Digital Technology-Standard 005</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No/Don’t know Pre-survey</td>
<td>No/Don’t know Post-survey</td>
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<tr>
<td>Are you able to demonstrate awareness of data management and data analysis software?</td>
<td>50</td>
<td>89</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>Are you able to demonstrate knowledge of spreadsheet and database applications and functions for collecting, sorting and organizing data?</td>
<td>50</td>
<td>94</td>
<td>50</td>
<td>6</td>
</tr>
</tbody>
</table>

**Recommendations of Changes**

The combined skill base of the *Cyber Tigers* team is experience in content development in instruction and less in web design features specific to visual and graphic layout. Time constraints made
production of content the priority for the team in consultation with our SME, also a content expert. A
next step would be consultation with a specialist in graphic design and web features. In the field of
educational technology such specialists are increasingly being used as educators are not all polished web
designers. It is important for real world design to recognize when additional expertise is needed and to
seek that input.

As a result of learner feedback, many changes were made to the original website. Design
alterations consisted of editing and formatting images, replacement of images, and creating consistency
of design elements and navigation tools. The navigation bar was altered to eliminate several blank pages
that interfered with user interaction. The hover-over color on the navigation bar was adjusted from
white to black to make the site more easily accessible to users with impaired vision. Headings that were
originally presented as links were changed to text only. The Ethical/Legal, Privacy, Safety
Considerations page was reformatted to eliminate an excess of white space at the bottom of the page
and to break several of the longer passages into shorter passages.

Conclusion

Throughout the development of the Computer Technology Endorsement Council’s approach
to assisting candidates for the Computer/Technology Endorsement Assessment, it became abundantly
clear that a wide range of skills, knowledge and resources are required for an Instructional Technology
Specialist. Professional positions which are open to the graduates of the University of Akron programs
are varied in their requirements and the degree to which specific skills are emphasized. The implication
for the candidates for the Computer/Technology Endorsement is that they will need a strong
background in a variety of skills for this field. The professionals in this field, most importantly, must
have the ability to access additional resources as necessary to fulfill evolving responsibilities and to keep
up with ongoing changes in all areas of professional practice. Continuous and rapid developments in educational technology, as well as emerging concerns in the area of legal and security issues, will require the technology specialist to remain abreast of developments in the field and vigilant with regards to maintaining professional standards. The Computer/Technology Endorsement Council website offers resources that can be utilized for ongoing professional development.
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