

Brigham Young University BYU ScholarsArchive

Instructional Psychology and Technology Graduate Student Projects

Instructional Psychology and Technology

2023-06-13

But What If It Was a Cartoon? Animated Instructional Videos for the California Debt and Investment Advisory Commission

Faith Jennings

Follow this and additional works at: https://scholarsarchive.byu.edu/ipt_projects

BYU ScholarsArchive Citation

Jennings, F. (2023). But What If It Was a Cartoon? Animated Instructional Videos for the California Debt and Investment Advisory Commission. Unpublished masters project manuscript, Department of Instructional Psychology and Technology, Brigham Young University, Provo, Utah. Retrieved from https://scholarsarchive.byu.edu/ipt_projects/64

This Design/Development Project is brought to you for free and open access by the Instructional Psychology and Technology at BYU ScholarsArchive. It has been accepted for inclusion in Instructional Psychology and Technology Graduate Student Projects by an authorized administrator of BYU ScholarsArchive. For more information, please contact ellen_amatangelo@byu.edu.

But What If It Was a Cartoon?

Animated Instructional Videos

for the California Debt and Investment Advisory Commission

Faith Jennings

Design Project Report Masters Instructional Psychology & Technology, Brigham Young University

Purpose

The purpose of this project was to design Module 6 of an eight-video module curriculum for the California Debt and Investment Advisory Commission (CDIAC). Elected officials from across California are the learners for the module.

Background

California is the most populous state in the United States. It also has the largest economy of any state in the U.S.; in 2021 California's gross state product was \$3.4 trillion. If California's economy is considered on its own it would be the fifth largest in the world and larger than those of India, the United Kingdom, or France ("Economy of California," 2023). Managing public investment and debt is key to how California is governed and its economy functions. The California Debt and Investment Advisory Commission (CDIAC) is the state's clearinghouse for public debt issuance information. Created in 1981 by state legislation, CDIAC is charged with "providing information, education, and technical assistance on debt issuance and public fund investments to local public agencies and other public finance professionals" (About CDIAC). CDIAC's activities are "classified into three general program areas: data collection and analysis, policy research, and education" (About CDIAC).

This project concerns CDIAC's educational mission. The guidelines and regulations surrounding public debt can be difficult to parse, even for public finance professionals. Newly elected officials often have a larger knowledge gap about how public debt functions and how to navigate the systems already in place in order to achieve their goals. In recognition of this, CDIAC has created an education portal with a distinct education path for elected officials (along with paths for municipal debt issuance education and public fund investment education).

The first training resource CDIAC created for elected officials was an expansive PDF document outlining definitions and explanations of different municipal finance terms and concepts. It was encyclopedic in format. CDIAC posted this PDF encyclopedia on their website for officials and other learners to download and access. This PDF contained an expansive range of information, but they found that its format as one large document was difficult for learners to navigate.

During 2019 and 2020 CDIAC reformatted this encyclopedia as a WordPress website. Having the encyclopedia in this new online, searchable format made it easier for learners to access the information they needed. However, for learners to search for specific information they first needed to know what specific information they were looking for. This was a high barrier for many learners. Many newly elected officials did not have robust mental models about how municipal finance functioned; therefore, it was difficult for learners to absorb new information.

As an experiment the CDIAC steering committee decided to create a module explaining finance concepts to help learners learn in a systematic way. CDIAC worked with a local community college to create a pilot video to gauge stakeholder interest in an online, video-based learning module. Stakeholders decided that animated videos would be a more effective form of learning and CDIAC solicited proposals from vendors to produce 8 instructional video modules under the Elect>Ed identity to instruct elected officials on different aspects of public debt.

At this point Advanced Problem Solving (APS) was brought on as a partner. APS took the video the community college had worked on and built it out into a full module which was released in 2019. Immediately after its release APS began working on additional modules with eight total modules being planned. The purpose of this project is to produce the videos for a combined Module 6/7, Marketing and Structuring Strategies for a Win-Win Debt Issuance.

Project Needs and Constraints

Audience Needs

The audience for CDIAC Elect>Ed training is made up of elected officials at all levels of California government (school board, city, state agencies, etc.) These adult individuals vary in age, educational and socioeconomic background, familiarity with technology, and experience making financial decisions. As explained by Kerrie Dunn, director of instructional design at APS in personal communication, these elected officials work with credentialed staff members who are already knowledgeable about municipal finance. While these staff members prepare documents and propose financial approaches to meet agency objectives, the "elected officials should have (or gain) a strong understanding of what it means to be a fiduciary as an elected official and should gain a basic understanding of the considerations and possible consequences related to making/approving financial decisions" (K. Dunn, personal communication, February 22, 2023).

Most of these learners do not have expertise in public finance, so is critical to the success of the module that the financial concepts are taught clearly in a mode that is accessible for beginners. These officials are responsible for committing their constituents to debt structures that can extend 30 years or farther into the future which will have long-lasting consequences. The financial professionals at CDIAC saw a need to create this curriculum to help elected officials understand the intricacies of municipal debt so these officials will be empowered to structure the bonds their agencies issue in the most beneficial way for their constituents.

While many of the officials are not well-versed in municipal finance, many of them are quite successful in their main careers. They are capable adults who were elected or appointed to positions of authority and it is important not to patronize them.

Environmental Analysis

Stakeholders

The client for this training is the California Debt and Investment Advisory Commission (CDIAC) and its staff. The commission consists of nine members: the State Treasurer, the Governor or the Director of Finance, the State Controller, two local government finance officials, two Assembly Members, and two Senators and while they are stakeholders in this training it is their staff members that will serve as Subject Matter Experts and be directly involved in the development of this module. The CDIAC SMEs are Robert Berry, Angelica Hernandez, and Tara Dunn.

Product Environment

The mandate from the client to APS is "to build the Elect>Ed courses so that they are accessed via an LMS, but responsive on both desktop and mobile devices" (Dunn, 2023). Besides creating the module, APS also manages the LMS. Most of the learners enroll in the LMS using their professional email accounts but it is unknown if they are taking the courses at work or at home. According to Kerrie, "That line is pretty blurry for elected officials" (2023).

Considering both instructional theory and the environmental factors, it will be important to divide the videos into more-easily absorbed chunks. This will aid in maintaining learner engagement and make it easier for learners to pause and then resume the module if they have to step away and continue their learning in multiple sessions.

Precedent

Many aspects of this project were influenced by the five preceding modules in the curriculum (see Figure 1): the format of the module, the types of assessment items used, the animation style, character and icon art, etc... At times it was challenging to fit my design within these confines.

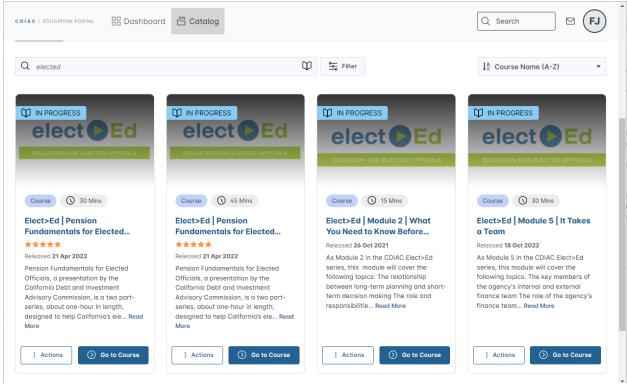


Figure 1: a view of preceding modules in the curriculum.

Budget

The budget for this project is proprietary and as such, I am unable to include some of the details in this report. However, after reviewing the different factors involved, it is my view that the only significant budgetary constraint that existed involved the contract animator. APS's contract with the animator included three rounds of revisions. If there were excessive revisions

beyond those, APS would have been charged for the extra updates. As a designer, this was definitely a concern. Fortunately, we took care of all necessary revisions without the allowed three rounds.

Addressing this concern influenced my strategy for dealing with client feedback. After reviewing each draft of the video with the clients I made a concerted effort to ensure that I understood their requested changes. I usually created new storyboards based on the client feedback, sent the storyboard to the client for their approval, and then sent the new storyboard onto the animator only after receiving confirmation that I had captured the client's intent. I also made an effort to bundle as many changes together as possible so there would be fewer rounds of revision and I think this was a successful strategy.

According to Zippia.com, the average hourly rate for an animator in Utah is \$41.00. Because this particular animator has worked on several of the CDIAC modules previously, I am estimating that his hourly rate is closer to \$46 an hour. I am also estimating that it will take 30 hours to create drafts of each of the parts of the module–60 hours total. Using these parameters, I am estimating the budget for animation to be approximately \$3,000 once revisions are added.

Developing prototypes for the animator, which was my job, was another major cost. I spent approximately 100 hours researching the prior modules, developing the storyboards, and meeting with clients. At a rate of \$20 an hour this is a total of \$2,000. In addition to this, I am estimating that it took 3 hours of production work by my more-experienced team members to get the versions of the module loaded into the LMS for review and for release at a rate of \$33 a hour (The 75th percentile rate listed for instructional designer on Zippia.com) which totaled is \$99.

The last remaining cost was hiring a professional voice artist to record the narration for the module. APS typically contracts for "full service" voice over narration. "Full service" means the talent has their own sound studio and equipment, does all the recording and editing, and then sends APS the clean final files. APS has used the same narrator for all of the CDIAC modules. For Module 6 they paid her \$1,000 for full service narration of a 30-minute recording, with a turn-around time of 24-48 hours from when she was sent the script. This price also included the possibility of 2 rounds of edits with a 48-hour turnaround time frame.

In total, the estimated active cost to produce this module was \$5,859. This is \$1,499 higher than I estimated in my proposal. This is because my development work took me 20 hours longer than anticipated, and I did not include the three hours of LMS work to releasing the module or the cost of narration in my proposal estimate.

Timeline

The actual project timeline took six weeks longer than I originally anticipated. Much of this delay was the result of several stages lasting a few days longer than I had planned. While I attempted to work in an agile manner, focusing on producing minimal viable products to keep my iterations quick, the development process had certain waterfall stages checkpoints built in. For example, we needed to receive the draft videos back from the animator in order to review

them. We had one notable delay: the animator we used experienced health problems during February and March 2023 which added a few weeks to the timeline. Fortunately, he made a full recovery.

October / November 2022

- Review existing Elect>Ed modules
- Script Review
- Receive the script from CDIAC and review it for clarity.
- Send suggested edits to CDIAC for their acceptance/rejection.
- Text of script is finalized

December 2022 / January 2023

- Begin development of storyboard.
- Refer to pre-existing visual glossary and use existing art for previously mentioned concepts.
- Use PowerPoint create slides for animated scenes
- Meet weekly with SMEs to review inprogress work as the storyboard is in development.

February 2023

- Send script to voice over artist to record narration
- Continue meeting weekly with SMEs to revise iterations of storyboard
- Hand off Part 1 of storyboard along with narration recording to animator
- Continue meeting weekly with SMEs to revise Part 2 of storyboard

March 2023

- Animator creates draft video of Part 1 with SMEs
- Review Part 1 with SMEs

- Create new storyboards for Part 1 as needed for revisions requested by SMEs
- Hand off Part 2 storyboard to animator

April 2023

- Animator creates draft video of Part
 2
- Review Part 2 with SMEs
- Create new storyboards for Part 2 as needed for revisions requested by SMEs
- Coordinate any needed changes to videos of Part 1 and Part 2
- Review assessment items provided by clients
- Suggest updates to assessment items as needed

May 2023

- Assemble videos and assessment questions into draft module
- Module is reviewed by myself, APS, CDIAC SMEs, and CDIAC steering committee
- Any needed revisions are made
- Module is added to CDIAC education portal and goes live
- An email to registered elected officials announcing the new module is sent through the LMS

Content or Task Analysis

This project is the sixth module in a series of eight modules. Due to business considerations APS develops the modules using scripts provided by the client without conducting any formal content analyses. I did not have the ability to alter the established development process, but for the purposes of this project I have conducted a content analysis of the module.

This module, *Marketing and Structuring Strategies for a Win-Win Debt Issuance*, coves abstract financial concepts and strategies. Most of the instruction is based on defining these concepts using facts or outlining rule/principles to explaining when specific strategies may be

advantageous for elected officials to use. Items in the content analysis below are categorized according to the key below.

Task Analysis Key				
C – Concept	F – Fact	R - Rule/Principle	P – Procedure	I – Interpersonal Skill

Topic	Sub Topic	Sub Sub Topic
Agency objectives (C)	Characteristics of objectives (C)	Objectives are formed by strategic, capital improvement, and financial planning. (C)
	Achievement of objectives (C)	 The elected official's decisions regarding authority, amounts, timing, repayment, and structure (C) The goals and objectives of the investors buying agency debt (C)
Types of Investors (C)	Retail Investors (C)	 Individuals that buy bonds on their own. Hold about 40% of municipal bonds (F) Do not actively trade their bonds (buy-and-hold) (F)

	Institutional Investors (C)	Managed funds, banks, and insurance companies. • They buy and sell bonds frequently in large \$ amount transactions (F)
U.S. Municipal Debt Market (C)	Characteristics of the municipal debt market (C)	 The municipal market is about \$4 trillion in size (F) contains about 1 million different municipal securities (F) has a daily trade volume that is 1/3 that of corporate bonds (less than once a month) (F) has a lower default rate than the corporate market (less than 5% that of corporate bonds) (F)
	Advantages of the municipal debt market (C)	Reasons municipal debt is attractive to investors • tax-exemption (C) • date-certainty of interest and principal payments (C) • very low default rates (C)
Corporate Bond Market (C)	Characteristics of the corporate market (C)	 The corporate market is about 2.5 times larger than the \$4 trillion municipal market (F) contains fewer than 50,000 different securities (F) has a higher daily trade volume than municipal market (F) has a high default rate—more than 95% that of municipal bonds (F)
Interest (C)	Interest is the cost of borrowing money. (C)	The higher risk there is for investors, the higher the interest costs are for the issuer. (R)

The Yield Curve (C)	Characteristics (C)	The yield curve graph
Competitive Sales Method (C)	Sales Process (P)	 On a prescribed date underwriters bid on bonds. (P) The underwriter with the lowest interest cost is awarded the bond (P)
	Advantages (C)	 Most effective in generating lower costs for recognizable, reliable agencies. (F) Best outcomes achieved in stable interest rate environments (F)
	Disadvantages (C)	The "arms-length" nature of bidding process may compromise agency policy objectives. (F) Agencies will be unable to target specific underwriters, like a veteran-owned underwriting firm target specific retail investors, like those that live in a certain area.
Negotiated Sales Method (C)	Sales Process (P)	 The agency selected the underwriter. (P) The underwriter works with the agency financing team to structure the bond issue (P)
	Advantages (C)	 The underwriter can use their market knowledge to assess market demand and help structure the bond to meet market demand. (P) Agencies can establish retail order period which lasts a day or two during which they can sell directly to certain retail investors if desired. (P)
Private Placement Sales Method (C)	Sales Process (P)	The issuer sells the debt directly to an investor group or bank (P) a. The customer is responsible for their own due diligence. (F)

	Advantages (C)	Private placement can allow for customized structures not normally available in the public market. (C)
	Disadvantages (C)	Compared to other methods, private placement often requires
Labeled Debt (C)	Explanation (C)	Issuers segregate debt directly linked to projects in areas of interest to investors (C)
	Examples (C)	 Environmental stewardship, labeled "Green" (C) Climate resilience, labeled "Sustainability" (C) Positive social impact, labeled "Social Impact" (C)
	Agency Requirements (C)	The agency commits to providing the market with post-issuance impact reporting. (P)
Measuring the cost of borrowing (C)	General Method (C)	Include the interest paid to investors and the agency's transaction cost (C)
	TIC Method (C)	 True Interest Cost Accounts for time value of money (a dollar today is worth more than a dollar tomorrow). (C) Expressed as an interest rate that equates the timing and amount of all future principal and interest payments to the amount the agency receives from the sale. (R) Includes the underwriter's spread (F)
	AIC Method (C)	All-Inclusive Cost • Calculated the same way as TIC but also includes all of the costs associated with the issuance. (F)
Credit Risk (C)	Importance (C)	The interest cost of your financing is directly related to the market's assessment of the risks associated with the purchase of your debt. (R)

	Default Risk (C)	Default risk is the probability that your agency will willingly pay principal and interest to investors on time, as scheduled, for the entire term of the debt. (F) • Lower default risk - debt to be repaid with revenue from the agency's authority to tax (C) • Higher default risk - debt to be repaid with revenue dependent of market forces (C)
Size of Issue (C)	Borrowing money only when needed is best. (C)	Your agency must select the timing and amount of debt to issue. (P) Consider the timing and amount of your agency's revenue stream (P) Consider the timing and amount of the project's expenditures. (P)
	Small issues do not attract as much attention from investors as large issues do. (R)	 This may increase issuance costs. Underwriters may need to increase marketing efforts (F) Other issuance costs, including internal costs, will be especially high per dollar raised in the financing of a small issue. (F)
	Larger issues may generate increased investor demand. (C)	Larger issues will be less costly per dollar to issue. • The amount borrowed should be driven by the project expenditure schedule. (R)
Serial / Term Bonds (C)	Serial Bond Characteristics (C)	 Generally have short-to-medium terms (F) Preferred by retail investors (F) Smaller issue sizes (F) Can take advantage of short-erm interest rates (F) Can match bond maturities with timing of revenues to lower the cost of financing (R)

	Term Bond Characteristics (C)	 Generally, longer-term maturities out to 15, 20, 30 years (F) Portion of the principal is repaid prior to maturity through sinking fund payments (F) Can be combined with serial bonds in an issuance (F)
Discount / Premium Bonds (C)	Coupon Rate (C)	The amount of interest that must be paid to investors on the interest payment date (F)
	Par (C)	Bonds sold with coupon rate equal to prevailing market rate (F)
	Premium (C)	Term for bonds sold with coupon rate greater than the prevailing market rate (F) • Investors will pay a premium (F) • Return cash to investors sooner through higher coupon payments (F) Advantages • Lower price volatility in the secondary market (C) • Preferred by investors (F)
	Discount (C)	Term for bonds sold with coupon rate lesser than the prevailing market rate (F) • Investors get a discounted price (F) • Issuers may elect to structure certain bonds at a discount to reduce interest payments in specific years of revenue uncertainty or to take advantage of the shape of the yield curve (F) Cautions • Given investor demand, the best value per dollar borrowed may be through issuing premium bonds (R)

Taxable vs. Tax-Exempt Bonds (C)	Tax-Exempt Bond Characteristics (C)	Pay interest to investors that is not subject to taxation • Investors will accept significantly lower interest rates (F) • Agencies will have lower borrowing costs (R) Caution • Agencies are required to meet IRS requirements for the investment and timely expenditure of proceeds and face other limitations (P)
	Taxable Bond Characteristics (C)	 Interest paid to investors is subject to tax. Taxable bonds make up a small portion of the total municipal bond market (F) It is an alternative if an agency cannot meet tax-exempt requirements (F)
Variable Rate Bonds (C)	Characteristics (C)	They are higher-risk and should be avoided by agencies without expertise and capacity to manage the risks (F) Advantages Attractive to issuers when short-term interest rates are low relative to long-term rates (F) Can reduce overall interest cost of the debt (F) Cautions Susceptible to interest rate fluctuation (F) Issuers typically required to post. instrument like letter of credit to mitigate liquidity risk of repayment source. (P) This adds costs and risk to transaction (F)
Capital Appreciation Bonds (CABs)	Characteristics (C)	 Does not pay interest semi-annually (F) Interest accretes and is paid when the bond is redeemed (F) Sold at a substantial discount (F) Requires use of a higher interest rate (F)

	Issuance Circumstances (C)	Agencies may issue this type of bond when they lack the current revenues but assume large increases in revenues in the future. (F)
Optional Redemption or Call Option (C)	Characteristics (C)	It is the option to repay the principal amount of the bond • Commonly included as a feature in some bonds (F) ○ If included in the bond, investors require compensation like higher interest rate or premium redemption price for the bond. (R)
	Strategies for use (C)	During periods of declining interest rates agencies can use the call option to • reduce or restructure debt (F) • release security pledges (F) • achieve debt service savings (F)
Refunding Bonds (C)	Characteristics (C)	 Issuance does not require voter approval (F) Subject to the same federal tax and securities laws as original debt and ongoing administration responsibilities (F)
	Strategies for use (C)	 May be useful If market interest rates have dropped compared to the rates on already issued bonds of comparable maturity (F) Can achieve significant savings by replacing longer term bonds with shorter term bonds (F)

Credit Rating (C)	Relevance (C)	A credit rating is the most important factor in how the market assesses the value of debt you issue. (C) The type of rating your debt issue is assigned directly impacts the cost of your financing—the higher the rating, the lower the total interest costs (R) It grades the probability that principal and interest payments will be made to investors on time and in full (C)
	Credit rating procedures (P)	Credit ratings agencies generated ratings using their own proprietary models. (F) Rating agencies analyze factors like • the type and amount of debt (C) • security of the repayment source (C) • the financial condition of the agency (C) • agency management practices (C)
	Advantages (C)	While not required, credit ratings give bonds greater market acceptance compared to unrated debt. (C) • Rated securities are more easily bought and sold. (F)

Content Analysis Results

After conducting this content analysis, the early encyclopedic roots of the project are especially evident. The knowledge gap between the SMEs and the learners is large, and the strategy to bridge it included in the client-provided script involves fitting as many topics into the module as possible. Most of the module is spent explaining concepts by sharing relevant facts or outlining required procedures. The module also includes explanations of the relationships between multiple concepts such as the higher the risk is for investors, the higher the agency's borrowing costs.

Product Design

My experience with this project has taught me valuable lessons about completing the instructional design process while simultaneously navigating the realities of being an employee (and a junior employee at that). Leaning on the instructional design processes I learned during my program, I had ideas about ways the module could be structured to improve learning outcomes.

The previous modules consist of approximately 10-minute videos followed by brief multiple-choice knowledge checks. When I evaluated this structure considering Merrill's First Principles of Instruction, it most closely resembles the "Tell-Ask" structure that Merrill finds to be "the least effective instructional strategy" (Merrill, 2018, p. 267). However, evaluating this product against Merrill's First Principles helped me understand which specific deficits I wanted to address.

Activation

The learners will each approach the module with their own unique model of prior knowledge. To help learners activate their knowledge as a foundation for the new topics that are taught in this module, I would have liked to display a brief message before the module begins encouraging the learners to review previous modules in the curriculum before completing this module. Because this is the sixth module out of a total of eight, it was not feasible to make this change in format for business reasons.

Demonstration

Since the targeted learners serve as elected officials in a variety of positions, the modules have avoided using specific examples that would further demonstrate the principles taught. The content is trying to walk the line of being specific enough to be relevant to all of the elected officials participating in the module while being general enough not to alienate any of the officials. Merrill says "Much instruction consists largely or entirely of presentation. What is often missing is demonstration" (Merrill, 2018, p. 267). It is this lack of demonstration that I believe ultimately limits how deep the learning from the module can be.

Application

The format of the completed module does not provide learners opportunities to apply what they are learning to real-life scenarios. As Hill and Jordan say, "relevance helps the student to want to learn the material by helping them understand how the material relates to their needs or how it can relate to improving their future" (2021, pg. 128). When dealing with an abstract and consequential topic like municipal finance, highlighting the relevance to the learners is important to keep learners engaged.

Integration

Merrill discusses integration as being part of deep learning which requires learners to integrate their newly acquired skills into their existing mental modes and he suggests one way of doing this is having learners "share, reflect on, and defend their work by peer-collaboration and peer-critique" (2018, pg. 268). Considering the module with this mind, I believe it would improve the learning experience if after viewing the videos the elected officials could gather annually for a workshop and presented with problem-based scenarios that they worked on as groups. Ideally, officials would be grouped together with those in similar roles: school district officials, county officials, city officials, etc.... Each group would be presented with a unique scenario similar to ones they may encounter in their roles as officials. They would then use the knowledge gained from viewing the module to craft a solution, after which each group would present their findings about and receive peer feedback. As Merrill says, "Learners need to apply their newly acquired skills to actually doing a task or actually solving a problem" (2018, pg. 268).

Problem-Centered

In previous modules the knowledge check questions focused on definitions and recall. While I believe it would be optimal to incorporate a problem-based activity/workshop into the module, it is not feasible within the confines of this project. One alternative would have been to incorporate situational, problem-based questions into the module knowledge checks.

However, with my project, the client/SMEs provided the assessment questions themselves. I had the opportunity to make suggestions about the specifics of the questions, which I did, but not to drastically change the format of the questions. The eight assessment items in the module all fall into the "Understand" or "Remember" categories of Bloom's Taxonomy (see Figure 2 below). Using only these types of does not take advantage of the opportunity to place information in relevant contexts for the learners. I would have liked to have added one scenario-based item to the module, but I did not have the ability to make this change to the pre-determined format.

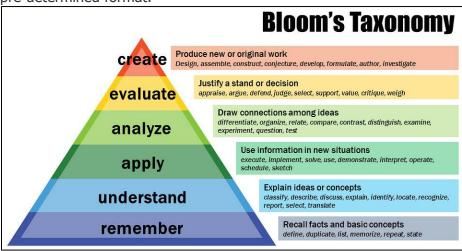


Figure 2: Blooms Taxonomy, Vanderbilt University Center for Teaching, CC BY 2.0

Improvements I Made

For business reasons I was unable to significantly alter the format of the assessment items. However, I was able to reduce the cognitive load on learners by altering the structure of the module. Previously, modules in this series have been formatted as two or three video segments each followed by a few assessment questions. The module I worked on was especially lengthy, with two videos clocking in at 29 minutes total. Each video was in the range of 13-15 minutes long. Research has shown that learner engagement begins to decline when instructional videos are longer than about 6 minutes (Brame, 2017). Considering this guideline, I advocated for the idea of dividing the two videos into smaller chunks, each followed by the single assessment question that related to the preceding material (See Figure 3).

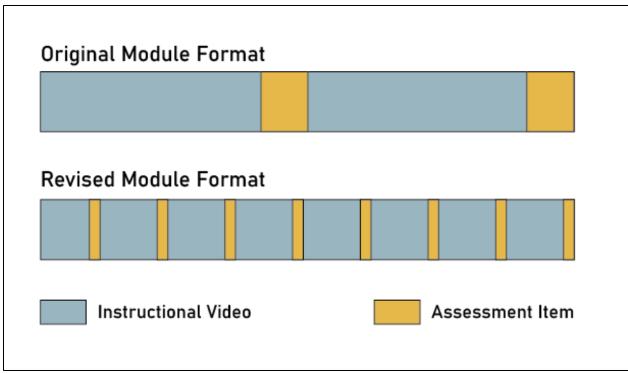


Figure 3: original and revised module formats.

My supervisor was supportive of this suggestion. The clients had some reservations, mainly that the format of this module would be different from the five other modules that preceded it and that doing so would interrupt the narrative flow that they had written into the script. After discussion of how this module was particularly abstract and citing the research that shows learners engage better with shorter videos, the clients agreed to structure this module in this format.

Design Details

I began this project by reviewing the previous five modules released in the series which deal with other aspects of municipal finance for elected officials. Next, I reviewed the client-provided script for Module 6. Knowing that the client was eager to cut word count where possible (the word count being specified in the contact they had with my employer, APS) I suggested edits where possible, sometimes rewriting sentences to use a more active voice, sometimes simplifying sentences for increased clarity.

Creating the storyboard that translated the script into visuals for the motion artist was the bulk of my design work. With such abstract subject matter, I took care to design the visuals to complement the audio. Research has shown that using auditory instruction along with visuals can improve learning outcomes (Clark, R., Nguyen, F., Swell, J., 2005).

The Product

The product is video module, hosted on CDIAC's education portal. Below is a screenshot of the module inside CDIAC's LMS.

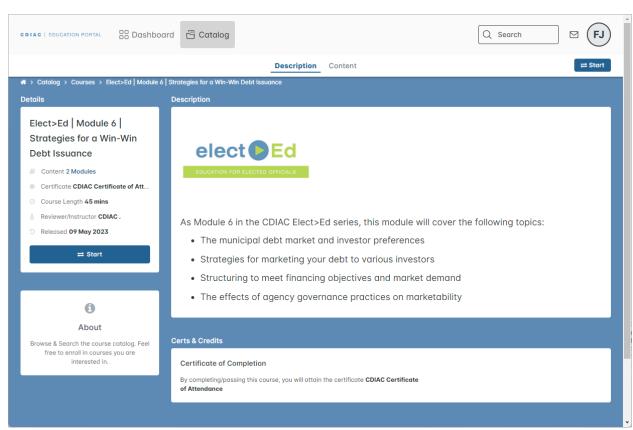


Figure 4: a view of Module 6 inside the CDIAC portal

After revising the format, the module is structured as outlined below.

Module Element	Description	
Video 1 (3:30)	Agency objectives, municipal bond market, types of investors	
Assessment Item 1	Drag-and-drop item re: investor segments	
Video 2 (1:22)	Risk and the yield curve	
Assessment Item 2	Multiple response re: the yield curve	
Video 3 (3:57)	Competitive, negotiated, and private Placement sales methods	
Assessment Item 3	Multiple response re: sales methods	
Video 4 (3:13)	Labeled debt, TIC, & AIC	
Assessment Item 4	Multiple response re: TIC and AIC	
Video 5 (1:56)	Default risk and revenue sources	
Assessment Item 5	Drag-and-drop re: spectrum of credit risk	

Video 6 (4:09)	Size of issue, Serial/Term bonds
Assessment Item 6	Multiple response re: serial and term bonds
Video 7 (6:23)	Discount/Premium bonds, taxable/tax-exempt bonds, variable rate bonds, CABs, optional redemption
Assessment Item 7	Drag-and-drop re: bond structures
Video 8 (4:56)	Refunding bonds, credit rating, agency objectives vs. investor preferences
Assessment Item 8	Multiple response re: credit rating

Figure 5: outline of video segments and assessment items that make up the module.

Link to Product

The full module, *Module 6: Marketing and Structuring Strategies for a Win-Win Debt Issuance*, is hosted on the CDIAC education portal which requires a free registration to enter.

I have published <u>a review link to the module</u>. If it is helpful, you may leave feedback directly in the module.

Video Walkthrough

https://www.loom.com/share/9088a163dc724396aca2d336c91010e6

Design Process and Evolution

Researching Precedent Products

I was excited, but intimidated, to come on board this project because the module I was designing was the sixth in a series of eight planned modules and there was a lot of preceding material to become familiar with. I spent a couple of weeks reviewing the previously-released modules to research the content they contained. In addition, I researched the ways in which that content was depicted visually, taking note of the icons used and the ways different concepts were depicted. Over the course of the first five modules a visual style and glossary of characters and icons had been developed, so it was important that the storyboards I created for Module 6 utilize the relevant characters and icons where appropriate to be consistent with the other modules.

Prototyping

The main chunk of my design process was spent creating prototype iterations. For my storyboards I took the client-provided script and cut it into sections which I pasted onto PowerPoint slides. Next, I created storyboards by inserting content or existing characters and icons onto the slides (see Figure 6). As part of the storyboards I included motion instructions in the Notes field of the slides for the animator (see Figure 7).

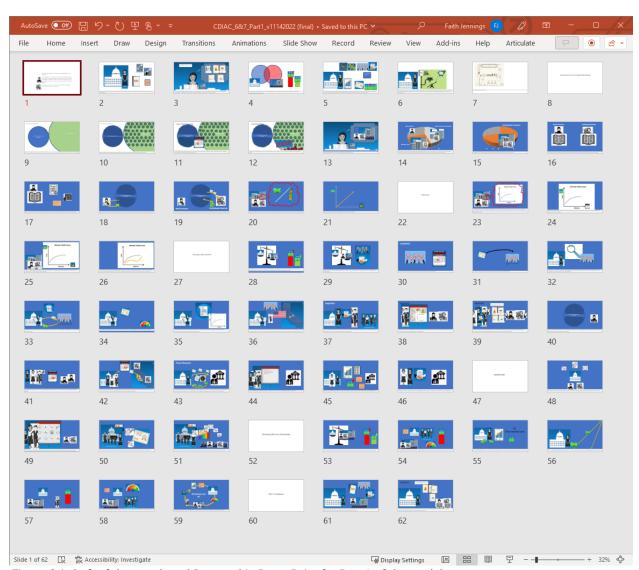


Figure 6 A draft of the storyboard I created in PowerPoint for Part 1 of the module.

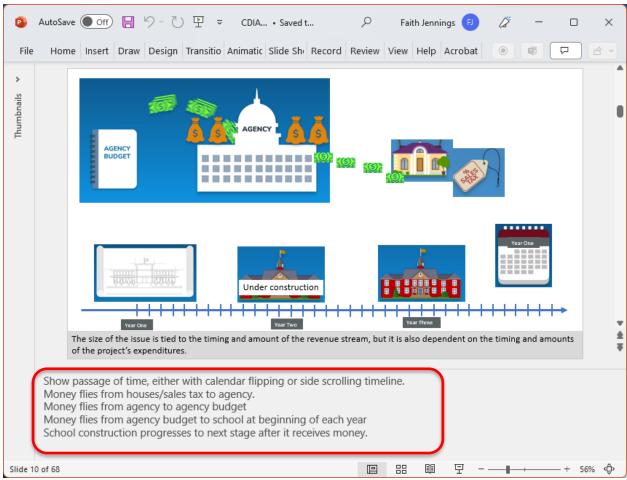


Figure 7 Animation notes included in the storyboard for the motional graphic artist.

During the prototyping phase my supervisor, another instructional designer, and I met weekly with the clients/SMEs to review the storyboards and gather their feedback. Sometimes I had to conduct my own research outside of these meetings to better understand the financial concepts I needed to teach visually. After every meeting I revised the storyboards in consideration of their feedback. If I was stuck on a scene, I was able to get feedback from my supervisor or team member which was helpful. Because the content was so abstract, some concepts required multiple treatments before they were finalized.

The clients provided assessment questions they had written for the module. The APS team reviewed the questions and suggested some format changes, but largely left the content as written by the client. This was a business decision: one made in light of the history of the preceding modules, the client/vendor relationship, and the current module's deadline. I would have liked to have included at least one problem-based question in the assessment, but it was not possible because of the circumstances mentioned above.

However, we were successful in making one significant change to the format. My supervisor and I advocated with the client to break the two videos up into eight chunks each followed by its relevant assessment guestion to improve the cognitive load of the module. After discussion

(some of which was a little awkward) the clients agreed to try the format change. I consider this a major win.

Production

Once the clients signed off on our storyboards, my team sent them off to the motion graphic artist, or animator. We also sent the script to a voice artist who recorded the script as a narration track. Referencing the mock-ups and motion instructions in the storyboard, the animator created a draft animation of the two videos and uploaded them to Frame.io so the design team and the clients could review them (see Figure 8).

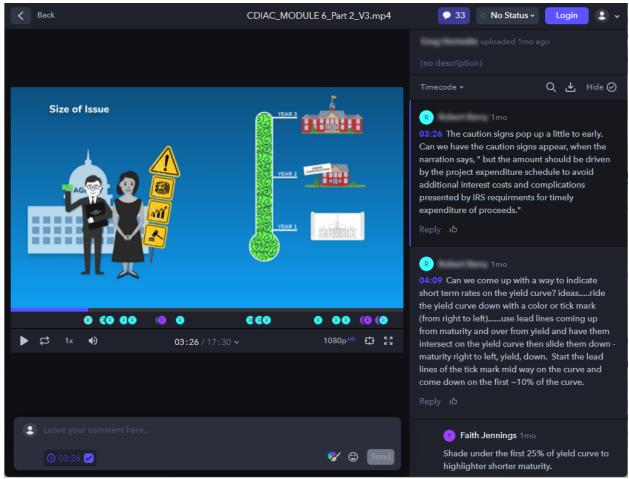


Figure 8: View of client feedback in Frame.io--names blurred for privacy.

We continued our weekly meetings with the clients/SMEs during which we discussed their feedback on the draft videos. I created additional storyboards of a few scenes they wanted heavily revised. The instructional design team and I met with the motion artist to discuss these scenes and shared the updated storyboards with him.

Once the motion artist completed full iterations of the videos that contained the narration and sound effects, the APS team met with the clients to review them together. The clients then shared the drafts with their larger steering committee, and directly solicited feedback from them.

Product Implementation

Once the module was complete, my supervisor uploaded it to CDIAC's education portal which APS manages, and turned it on. To help raise awareness of the new module, CDIAC designed a banner ad and APS placed it on the portal so existing learners would see it (See Figure 9). CDIAC also asked APS to email an announcement about the new module to already-registered learners. Lastly, CDIAC, through the office of the California State Treasurer, issued a press release (see Appendix A).

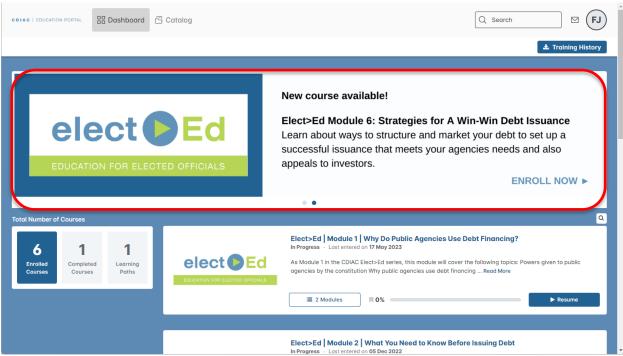


Figure 9: The banner ad announcing the new module in the CDIAC portal.

Assessment of Student Learning

Gathering user data for the module was outside the bounds of this project for APS. Working around this constraint, I conducted UX testing with a test user. This user fit into the demographic range of learners: 47, male, college-educated, but without much experience with municipal finance. One way the user differed from the demographic is that this was his first experience with any of the CDIAC modules, whereas most of the other learners will have completed at least one other module.

The test user got three of the eight items incorrect. The passing score is set at 80%, which means that users must get seven questions correct to pass. However, CDIAC wants to encourage users to pass the module. The module's settings allow users that do not pass on their first attempt to navigate back to the items they got incorrect and reattempt the items until they achieve a passing score.

The test user experienced some confusion with how the multiple response items were scored. He noted that even after viewing the item feedback he was still unsure of which answers were correct: it was not clear to him that the responses outlined in green should have been selected while none of the responses outlined in red should have been selected (see Figure 11).

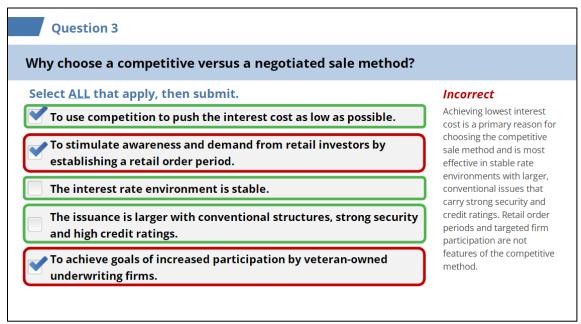


Figure 10: Assessment Item Feedback

The development process of these CDIAC modules does not include a formal step for assessing learner outcomes: all of the formal assessment and evaluation of the product occurred before the product was released. As a junior employee joining this multi-year project, I did not feel it was my place to suggest significant changes to the development process that would add time and cost. The clients created the assessment questions themselves and while APS offered feedback it was understood that the questions were to remain mostly the same.

Evaluation

This project was particularly very client-driven; because of this CDIAC, rather than the designers, conducted the product evaluation. Our clients had their larger steering committee review the module when it was semi-complete: the videos had been combined with the assessment items, but the final sound effects had not yet been added. Our CDIAC clients sent a review link to additional CDIAC staff (both finance professionals and elected officials) and a committee of 12-20 external stakeholders from across California. This committee has previously approved the scripts that the videos were created from so they are familiar with the content. Based on their feedback, we reworked the animation for the CAB section: switching the imagery from a helium balloon to a water balloon to increase the sense of foreboding. Having made that update, the module was released. There are no plans to conduct any further formal evaluations.

With the summative product evaluation review handled by the client, I focused on an internal evaluation. I created a rubric for evaluating these aspects of the module: cognitive load,

learner engagement, as well as my work as a designer. My supervisor, Kerrie Dunn, has been involved with the CDIAC project since the beginning so she has both an intimate knowledge of the project's history along with my contributions. The rubric and her responses are shown in Appendix B.

Annotated Bibliography

Domain Knowledge

Before I began work on this project I was largely unfamiliar with the size and scope of the economy of California. Researching California's economy helped me better understand the learner needs and the stakes at play for elected officials to make financially prudent municipal bond decisions.

Economy of California. (2023, February 3). In Wikipedia.

https://en.wikipedia.org/wiki/Economy of California#:~:text=The%20economy%20of%20the%20State,Germany%20and%20ahead%20of%20India.).

This article helped me understand the scale of California's economy, especially in relation to other economies around the world.

California State Treasurer. (n.d.). About CDIAC. CDIAC Introduction. Retrieved February 3, 2023, from https://www.treasurer.ca.gov/cdiac/introduction.asp

This website helped me understand what CDIAC was and learn about their organizational mission.

I was especially interested in what the research recommended when it came to designing instructional videos. I knew that because my project was one module of a larger in-progress project I would be limited in what changes I would be able to make, but it was important to me to understand what best practices were generally agreed to be.

Brame, C. (2017, October 13). *Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content*. CBE—Life Sciences Education 2016 15:4. Retrieved April 18, 2023 from https://www.lifescied.org/doi/full/10.1187/cbe.16-03-0125

This article was helpful to me as I sought to translate cognitive load theory into specific elements of instructional videos. The article suggests that designing mindfully with the elements of 1) cognitive load 2) student engagement 3) active learning in mind can help instructors maximize the benefits of instructional material. For the rubric I created I used metrics that fall into these three categories. I especially appreciated the list of specific choices Brame listed in each of these three areas. The suggestion that multiple videos in a lesson should be six minutes or less had a major impact on my proposal to revise the module format and chunk the video into eight smaller segments rather than two 15-minute segments.

Murdock, Kelly L., "Exploring Heuristics and Best Practices for Redesigning Instructional Video" (2022). Theses and Dissertations. 9749. Retrieved February 2, 2023 from https://scholarsarchive.byu.edu/etd/9749

I was pleased to find a dissertation on instructional videos by Kelly Murdock, a Ph.D graduate of the IP&T program. Murdock's discussion of different heuristics of instructional video and the research that had been done into them, notably by Guo et al, was very helpful to me. This article was the first one where I came across Guo et al's recommendation of videos being six minutes or shorter which had a major impact on my design decisions.

Learning Theory

Studying Cognitive Load helped me empathize with my learners and understand the processes they would be going through.

Clark, R., Nguyen, F., Swell, J. (2005). Efficiency in learning: evidence-based guidelines to manage cognitive load. Pfeiffer. Retrieved from https://learning-oreilly-com.byu.idm.oclc.org/library/view/efficiency-in-learning/9780787977283/

This book helped me understand how learners construct schemas to incorporate information into their memory. It also emphasized how experts in a topic will have built up capacity for larger schema but beginners need to construct simpler schema. This influenced my decision to advocate to chunk up the videos into small segments and also explained some of the initial push-back we received from our SMEs. Because the SMEs already have complex schema in place for the content they provided for the module, it seemed much simpler to them than it would to a novice. This book also made me aware of the different types of cognitive load my learners would be experiencing: intrinsic, germane, and extraneous and how important it was to balance the three types.

Instructional Design Approaches

Merrill, M. D. (2018). Using the First Principles of Instruction to Make Instruction Effective, Efficient, and Engaging. In R. E. West, Foundations of Learning and Instructional Design Technology: The Past, Present, and Future of Learning and Instructional Design Technology. EdTech Books. Retrieved from https://edtechbooks.org/lidtfoundations/using the first principles of instruction

Merrill's First Principles of Instruction were helpful to me as I brainstormed how I would like to design the module. I agree with the idea that including problem-based learning is beneficial to learners as he advocates, and I would have liked to include some scenario-based assessment items in the module. However, business constraints meant that I unable to deviate from the existing format in that way.

Hill, J. & Jordan, L. (2021). Instructional Strategies. In J. K. McDonald & R. E. West (Eds.), Design for Learning: Principles, Processes, and Praxis. EdTech Books. https://edtechbooks.org/id/instructional_strate

Hill and Jordan emphasize the important and benefits of including relevant material in instruction. Because this module is for all elected officials in California: school district officials,

county officials, city officials, state officials, etc....the module by necessity omits discussing specific scenarios. However, if we prioritized the principles in Hill and Jordan's work, structuring the module to include specific scenarios for each of these official types, perhaps in a branching format, would be something to consider.

Design Knowledge

It sounds trite, but for me the most important takeaway from this project is the importance of communication. I learned that it did not matter how much research I had done to back up my proposal to divide the module videos into small chunks if I did not communicate well with the client. However, having done the research was critical to advocating for my position. When I first mentioned the idea of chunking the videos to the clients, their knee-jerk reaction was to be against the idea. Once my supervisor and I took the time to explain that according to research, videos were less effective if they were longer than about six minutes, they began to be more open to the idea, but they were still not enthusiastic about it. I felt strongly about the idea and so it was worth it to bring it up again at the next meeting we had. There were some awkward pauses as they considered the idea, and I felt an urge to jump in and tell them "never mind!" But I resisted and waited for them to speak because I felt strongly that this change would improve the product for the learners. The awkwardness was worth it because they agreed to try out this new format which I believe will benefit the learners.

Communication was also key in managing the exchange of feedback. It was important to accurately capture the clients' feedback and then package it in an easy-to-understand format before sending it on to the animator. It was not enough just to record the feedback; I had to put effort into ensuring it was understood correctly to avoid delays and additional cost. Working well with feedback was also important when it came to creating quick iterations to keep the project momentum going, something I learned from the IP&T project management class and tried to apply here.

Design Critique

It was at times frustrating to not be able to apply other things I had learned during my IP&T coursework to this project: namely, not being able to include problem-based learning or conduct much formal evaluation. I often felt pulled between "doing it right" and "getting it done." However, as I plan to continue working as an instructional designer in the corporate sector I think I'm likely to feel this tension often, so this was good practice. While I was not able to make all of the design choices I wanted to, the experiences I had learning to balance best practices with real life business situations was valuable in and of itself.

Conclusion

I thoroughly enjoyed my time in the IP&T program, and the only reason I was able to successfully complete this project was by relying on the skills and knowledge I gained there. One of key takeaways I took from the program is the importance of doing the pre-planning work: learner and environmental analyses, research, prototypes, etc.... Being prepared helped calm the nerves I felt going into a new situation. Being prepared helps me feel confident that I

can handle the hiccups that will inevitably occur in the real business world. Having done this pre-planning work also helped me justify or translate my design decisions for clients without getting (very) flustered.

I have enjoyed school since I was a child and returning to BYU as a non-traditional student to earn a master's degree was the achievement of a dream. Besides my brother, I am the first in my family to earn an advanced degree. My father was the first in our family to earn an undergraduate degree, which he did with support from the G.I. Bill. My mother is an immigrant and did not have many opportunities to pursue much formal education, but she yearned to earn her G.E.D. and continue on in school.

Witnessing my mother's desire to improve her education and her frustration at the obstacles that stood in her way are a formative part of my identity as a designer. Being her daughter has heightened my awareness of the importance of learning opportunities for **all** people. I am grateful to the IP&T program for the skills and experiences it has empowered me with so I will be able to design learning solutions to help people from all walks of life enrich their lives.

Appendix A

Press release announcing the release of the module



FOR IMMEDIATE RELEASE

PR 23:20 May 10, 2023

State Treasurer Fiona Ma Releases Latest Municipal

Contact: Joe DeAnda

(916) 653-2995

SACRAMENTO – State Treasurer Fiona Ma today released the latest municipal finance training module designed for elected officials. The module, titled Marketing and Structuring Strategies for a Win-Win Debt Issuance, is the sixth in the Elect>Ed Debt Issuance and Administration series designed to help elected officials navigate the complex and critically important world of municipal finance and debt issuance.

Finance Training Module for Elected Officials

"Effectively using and managing debt is critical for local governments," said Treasurer Ma. "This new module continues my office's efforts to ensure that California decision makers at all levels have the resources they need to make informed decisions on behalf of all Californians."

Elect>Ed modules are produced by the California Debt and Investment Advisory Commission (CDIAC), which is chaired by Ma as state treasurer. The courses are offered through CDIAC's Ed Portal, a learning management system that delivers a self-directed learning experience and creates the means to track the program's effectiveness in meeting the learning objectives of the target audience.

Previous modules in the series include:

Module 1 | Why Do Public Agencies Use Debt Financing (15 mins)

Module 2 | What You Need to Know Before Issuing Debt (13 mins)

Module 3 | Strategy Drives Structure (25 mins)

Module 4 | The Use of Debt Policies to Manage Risk (22 mins)

Module 5 | It Takes a Team: The Role of External Professionals in a Successful Issuance (20 mins)

Module 6 | Marketing and Structuring Strategies for a Win-Win Debt Issuance (29 mins)

A seventh module, The Commitments You Make: Implications and Documentation of Long- Term Debt, is expected later this fall.

CDIAC has also released Part 1 and 2 of the Elect>Ed Pension Fundamentals Series:

Part 1 | Pension Introduction (27 mins)

Part 2 | Elected Officials' Role in Pension Management (40 mins)

All modules are free for decisionmakers and can be accessed online:

https://edportal.treasurer.ca.gov

There are approximately 4,400 local government agencies in California, which include cities, counties, K-14 districts, and special districts and are represented by thousands of local officials. About 60%-70% of local governments issue some kind

of debt. CDIAC improves the practice of public finance in California by providing responsive and reliable information, education, and guidance to state and local public agencies and other public finance professionals.

###

Fiona Ma is California's 34th State Treasurer. She was first elected on November 6, 2018, with more votes (7,825,587) than any other candidate for treasurer in the state's history and reelected on November 8, 2022. She is the first woman of color and the first woman Certified Public Accountant (CPA) elected to the position. The State Treasurer's Office was created in the California Constitution in 1849. It provides financing for schools, roads, housing, recycling and waste management, hospitals, public facilities, and other crucial infrastructure projects that better the lives of residents. California is the world's fifthlargest economy and Treasurer Ma is the state's primary banker. Presently, her office processes more than \$3 trillion in banking transactions. She provides transparency and oversight for the government's investment portfolio and accounts, as well as for the state's surplus funds. Treasurer Ma oversees an investment portfolio that currently averages over \$200 billion—a significant portion of which is beneficially owned by more than 2,200 local governments in California. She serves as agent of sale for all State bonds and is trustee of billions of dollars of state indebtedness.

###

For more news about the State Treasurer's Office, please follow Treasurer Ma on Twitter at <u>@CalTreasurer</u>, Instagram at <u>@CalTreasurer</u>, and on Facebook at California State Treasurer's Office.

Appendix B

Evaluation Response by Kerrie Dunn, Director of Instructional Design at APS

1-5 1= Low	Comments If Any
5=High	Comments if they
5	
5	
4	Some of the clips are lengthier than the ideal, by client request. However, Faith did an excellent job of steering the client toward this goal by explaining the rationale and by providing options, and found a good compromise.
5	
5	
5	
N/A	This was not part of the planned program for this client's project.
5	Yes!
5	This is one of the most challenging parts of working with SMEs. Faith took it on very well and actively looked for feedback while building this skill. Great work.
5	Faith took a real sense of ownership. She worked to understand the client's goals and intent and then used her skills and expertise to really make that come to life.
	1= Low 5=High 5 5 4 5 5 5 N/A 5 5 5 5 N/A 5 5 5 7 7 7 7 7 7 7