Standardization of Forms, Templates, and Processes for Implementing an E-Learning Program with a Decentralized Instructional Design Team

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The purpose of this project was to implement an e-learning program for a decentralized instructional design team. The team is decentralized by department, location, and reporting structure. Therefore, successful collaboration among the team members requires the implementation of standards and processes to ensure a consistent level of quality in the e-learning instructional content. This consistency was introduced and maintained through the ADDIE instructional design model; and development and implementation of consistent software templates, writing standards, forms, and processes.

E-learning is a category of instruction in which digital devices (including computers, tablets, and mobile phones) are used to deliver the instructional materials, engage the learners, and support intended learning outcomes (Clark & Meyer, 2016; Davis & Wong, 2007). Effective instructional design of e-learning courses is more important for achieving learning outcomes than the media that is chosen for instructional delivery (Mayer, 2003). Therefore, to increase the effectiveness of e-learning, the focus should be placed on instructional design.

In a 2017 survey of 546 talent development leaders, the Association of Talent Development (Robinson, 2017) concluded that 88% of the organizations offered e-Learning in their training and development portfolios, with higher performing organizations employing e-learning more than lower performing organizations. Of additional note in the ATD report (Robinson, 2017) were the common barriers to e-learning implementation, which included lack of training in general instructional design and e-learning design, in particular.

In this article, we share a case study of the first author's experience and results of implementing an e-learning training program for instructional designers in an organization with a decentralized instructional design team. We focus on the process of standardizing authoring software templates, writing standards, forms, and the process for designing e-learning across the organization. Subsequently, we evaluated the training program and suggested future actions for maturing the e-learning program.

Company Background

Company A is a leading manufacturer of heating, ventilation and air conditioning (HVAC) equipment with sales throughout the United States and Canada. The company had four manufacturing plants, two in Texas and two in Tennessee, as well as over 200 retail branches that served local dealers and distributors. In 2012, Company A was acquired by Company B, which was a foreign-based HVAC organization that had a strong global presence except in the United States. At the time of the acquisition, the North American division of Company B was using a learning management system (LMS) to track and report data for classroom and webinar training. The few e-learning offerings were authored in the home country and translated for English-speaking employees in the United States.

In 2015, Company A was encouraged to internally adopt and utilize the LMS for training its employees. A Learning and Development (L&D) team was established within the Human Resources (HR) department to oversee the LMS implementation and the development of new e-learning content. In 2016, the internal LMS—called The Compass—was launched.

Problem Statement

The Compass was launched using e-learning content from external vendors, but there was a desire to create custom courses that addressed the specific learning needs of the employees in Company A. A Content Manager (CM) joined the L&D team with the task of designing and developing new e-learning content, but the demand for content quickly surpassed the capacity of a single person. Other training groups within Company A were willing to create their own e-learning content, but they lacked the knowledge and experience required for e-learning development. In addition, each training group had its own style and format for the creation of training materials, which lacked consistency and an organizational standard. A common knowledge of e-learning design and development did not exist, so no e-learning content would be developed without a structured plan.

The CM was tasked with creating an e-learning design and development program that would allow various groups within the organization to develop their own learning content, while maintaining an organization-wide standard and quality of instruction.

The decentralized instructional designers in the various departments were experienced in creating instructional content for classroom and webinar training but had no experience in the design and development of e-learning content.

Therefore, the purpose of this project was to create an e-learning program at Company A that would allow instructional designers across the organization to develop instructional content that is consistently formatted, instructionally sound, and SCORM-compliant for the LMS. The goal of the program was to standardize the entire instructional design process from initial contact with a subject matter expert (SME) to evaluation of the final product.

Conceptual Framework

The design of an e-learning course can enhance or hinder the retention of information by the learner (Mayer, 2003; Sorden, 2005). An effective e-learning course should be designed to optimize the cognitive abilities of the learner by tailoring the instructional materials to minimize extraneous cognitive processing and promote essential cognitive processing (Clark & Meyer, 2016; Mayer & Moreno, 2003). Such a design requires an understanding of how individuals analyze and retain information during the learning process (Sorden, 2005).

The project at Company A was based on the application of the Cognitive Learning Theory (Meyer & Moreno, 2003) to e-learning design. Moreover, like many other organizations (Klein & Kelly, 2018), the L&D team at Company A uses the ADDIE model as a structured model of instructional design for all training design and development projects. Finally, the Capability Maturity Model (Marshall, 2001) formed a basis for evaluating the resulting training program.

Cognitive Learning Theory for E-Learning

Multimedia learning is a form of e-learning that involves information acquisition and/or knowledge construction when the instruction is presented using words and pictures together (Mayer, 2002; Mayer & Moreno, 2003). In multimedia learning, multimedia narration and graphical images produce verbal and visual mental representations, which integrate with prior knowledge to construct new knowledge (Kirschner, 2002; Mayer & Moreno, 2003). This concept is outlined in the Cognitive Theory of Multimedia Learning and is based on four assumptions (Sweller et al., 1998). The first assumption is that a person's short-term memory includes subsystems for processing auditory and visual information (Mayer & Moreno, 2003). The second assumption is that each subsystem of the short-term memory has a limited capacity (Miller, 1956). The third assumption is that humans can learn when they are able to attend to relevant incoming information, organize that information, and integrate the information into existing knowledge (Mayer & Moreno, 2003). The fourth assumption states that learning connections can only be made if the visual and verbal information in the short-term memory correspond to each other (Sorden, 2005).

As outlined in the Cognitive Theory of Multimedia Learning (Mayer & Moreno, 2003; Sorden, 2005), these four assumptions translate into the following practical applications for e-learning design and development:

- Use a combination of text and images that share a mutual relevance (Mayer, 2002).
- Present information in smaller "chunks" to avoid cognitive overload due to the limited capacity of the short-term memory (Meyer & Moreno, 2003).
- Design and develop instructional materials that are relevant and meaningful to the learner to enhance learning (Sorden, 2005).
- Create instruction that calls upon previously developed schema (from long-term memory) to reduce the cognitive load on the short-term memory (Kirschner, 2002).

Addie Model

The ADDIE model (Schlegel, 1995) of instructional design was adopted as the standard for the design and development of instructional content at Company A. The ADDIE model implies a progression of five phases of instructional design: Analyze, Design, Develop, Implement, and Evaluate. In the project described herein, the CM executed ADDIE as shown in Figure 1.

Figure 1

ADDIE Model of Instructional Design
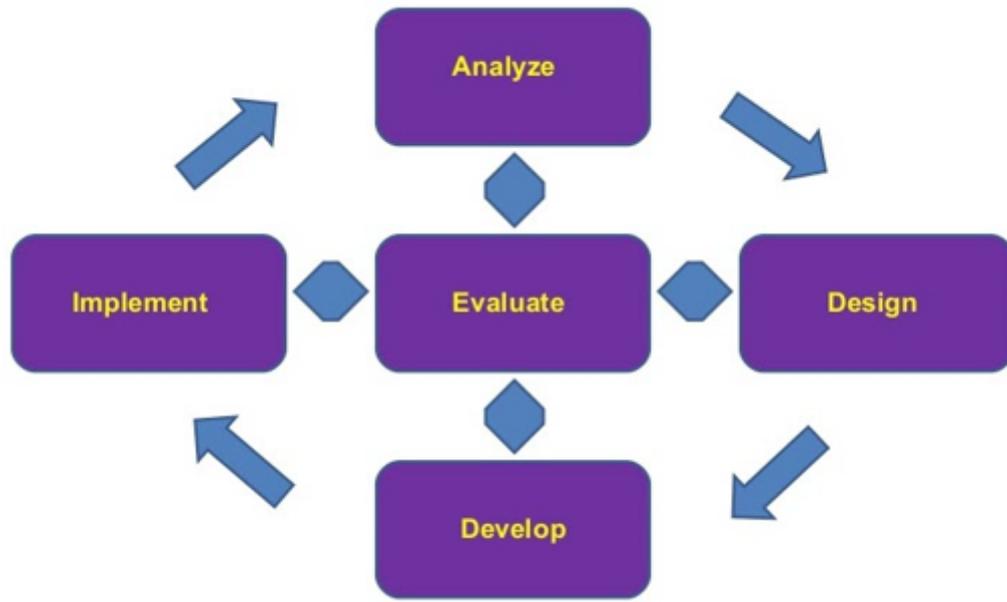
As executed in Company A, the first four phases of ADDIE are represented as a cycle with the Evaluate phase continuously applied to all other phases to ensure the learning program meets the required objectives. The ongoing evaluation of the current project was based on the Capability Maturity Model (Paulk et al., 1993).

Capability Maturity Model

A high-quality e-learning program matures over time as the participants and stakeholders in the program adapt and change. This maturing process can be charted using a Capability Maturity Model (CMM), which tracks the progress of a learning program from inception to full maturity. Capability maturity models were developed to reflect the idea that organizations engaging in these types of improvement actions consciously and repeatedly were more effective than organization that did not do so (Marshall, 2001). A CMM is composed of five levels of maturity that create a foundation for continuous performance improvement (Marshall & Mitchell, 2002; Paulk et al., 1993):

1. **Initial**: Process is at an ad hoc starting point.
2. **Repeatable**: Process is documented and can potentially be repeated.
3. **Defined**: Process is confirmed, documented, and standardized.
4. **Managed**: Detailed measures of the process and product quality are collected and controlled.
5. **Optimizing**: Continuous process improvement is facilitated by feedback from the process and new ideas.

Marshall and Mitchell (2002) adapted the standard CMM to e-learning to create an e-Learning Maturity Model (eMM) that can be used as a framework to improve e-Learning processes. The five levels of the CMM were adjusted to better align with the principles of e-learning design and development, which resulted in the following levels:

1. **Initial**: No formal processes exist.
2. **Repeatable**: Clear objectives for e-learning with deliberate process established.
3. **Defined**: Defined, structured, and integrated process for learning.
4. **Managed**: Ensuring the quality of both the e-learning resources and student learning outcomes as an organizational approach.
5. **Optimizing**: Continual improvement of educational effectiveness.

For each level of the cMM, key outcomes are assessed in four areas: *Student Learning*, *Resource Creation*, *Project Support*, and *Organization*. The maturity level of each of these areas also increases across the five levels of the eMM.

Method

In the field of instructional design, "the current focus is on the design and utilization of both instructional and non-instructional processes and resources to improve learning and performance" (Klein & Kelly, 2018, p. 225). Accordingly, to standardize e-learning design and development across Company A, the content manager determined that several processes, forms, templates, and standards would need to be developed. The fundamental tenets of Cognitive Learning Theory (Mayer & Moreno, 2003) could be achieved for Company A by implementing writing standards, software templates, an internal instructional design process, and forms for gathering requirements. The focus on these four items represents the five phases of the ADDIE model and when used properly, they would help Company A establish consistency in the e-learning courses produced across the entire decentralized instructional design team.

Standardized Writing Style for E-Learning Design and Development

Writing standards have implications for the design and development phases of the ADDIE model. The underlying foundation of effective e-learning design and development rests in the concepts of entering a cognitive state of flow (Davis & Wong, 2007) and efficient cognitive processing (Paas et al., 2003). These ideals are partially attained through the consistent use of instructional text and an e-learning interface and formatting structure that remains the same, regardless of the course or instructional designer. To achieve consistent text, the CM sought a set of writing standards from the organization. The standards provided were very limited and not in use by much of the organization, so the CM deemed it necessary to create a functional set of writing standards for the e-learning program, which would follow the Microsoft Manual of Style 4th edition.

Standardized Software Templates for E-Learning Design and Development

Authoring software is commonly used to develop e-learning courses as evidenced by Klein and Kelly's (2018, p. 231) finding that "knowledge and experience with e-learning authoring software such as Captivate, Presenter, Storyline, or Lectora" is the third most common competency identified in job announcements for instructional designers. Software templates can be used to create a consistent learner experience from slide-to-slide and from course-to-course. The learner should not be focused on the design of the course, but rather on the content embedded within the course. A properly designed template should be leveraged during the design and development phases of the ADDIE model to reduce the intrinsic cognitive load of the learner.

When this project began, the CM was using Lectora to build e-learning courses. Course builders in other departments were using authoring software entitled Claro, which is associated with the LMS. The CM developed an e-learning template for Lectora that met all standards of cognitive efficiency and received approval from the project sponsor and an executive stakeholder. The template for Claro required the development of two templates due to the nature of the software. Claro imports a presentation from PowerPoint, which can then be further enhanced. A basic PowerPoint presentation file that is specific to Claro was created by the CM. The CM also created a template in Claro that incorporated the required branding standards of the company. There are limitations within the Claro software regarding navigation, so a less than desired outcome had to be accepted. The Claro templates were also approved by the project sponsor and executive stakeholder.

Each of the authoring software in use required a basic development template that incorporated required branding standards, such as company colors, logos and copyright language. Additional requirements included a consistent navigation structure with controls and are easy to see and use. The intent of the template design is to make all of the colors, borders, and controls fade into the background so the learner is focused on the instructional content rather than extraneous aspects of the course.

As the project progressed, two instructional designers were added to the L&D team in the HR department. These designers did not have working knowledge of Lectora or Claro. Instead, they were experienced in Articulate Storyline – a third authoring software. Because these designers needed a template in Storyline to perform their duties, the CM added an additional template creation to the project schedule. Under the guidance of the CM, the new instructional designers created a working template for Storyline that allows multiple branded courses to be published from a single file. This feature allows the designers to create a single course containing instructional content that publishes for multiple brands through the use of variables for the company name and associated images.

The software templates allow the flow of content in all courses to meet the pattern expectations of the learner. Each slide of a course has a specified flow of content from slide to slide, and from section to section, supporting the coherence effect of e-learning (Mayer, 2002). Figure 2 was developed to assist the course designers with content design and development.

Figure 2

Illustration of Standard Content Flow
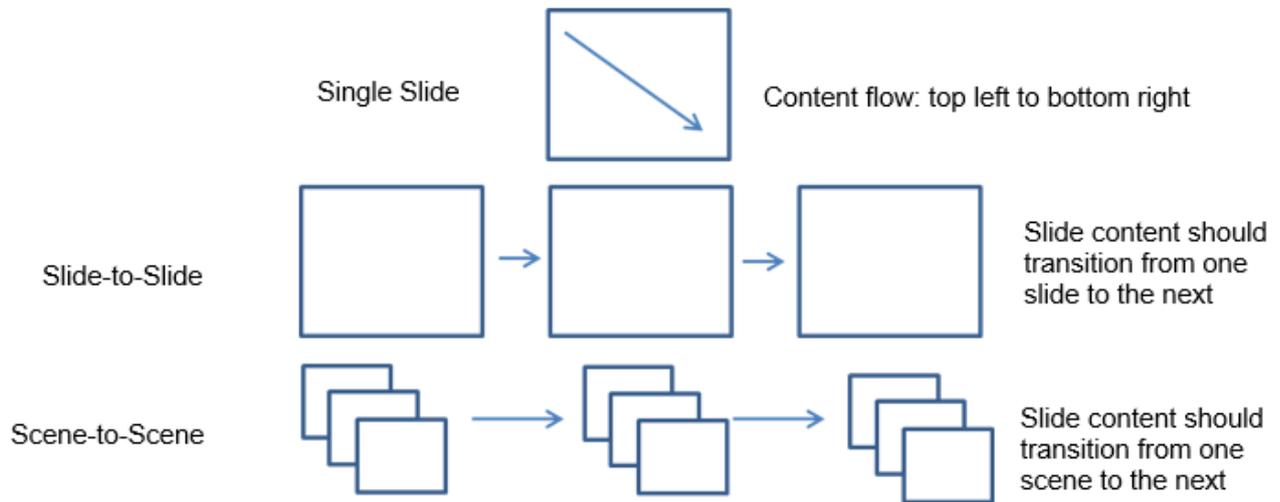
Standardized E-Learning Instructional Design Process

The newly created instructional design processes are applicable for all phases of the ADDIE model and are the nucleus of the standardization across the organization. Prior to the initiation of the project, the organization had instructional designers and instructors who each created classroom training materials on their own. The instructional designers had their own process that followed the phases of the ADDIE model. The CM augmented this established process to incorporate the additional steps of e-learning development and implementation, as shown in Figure 3. The area enclosed in the dashed blue line contains the steps that were added to the existing instructional design process. The CM acquired approval for this process from the project sponsor. All e-learning content developed in Company A must follow this new process.

Figure 3

Augmented Instructional Design Process
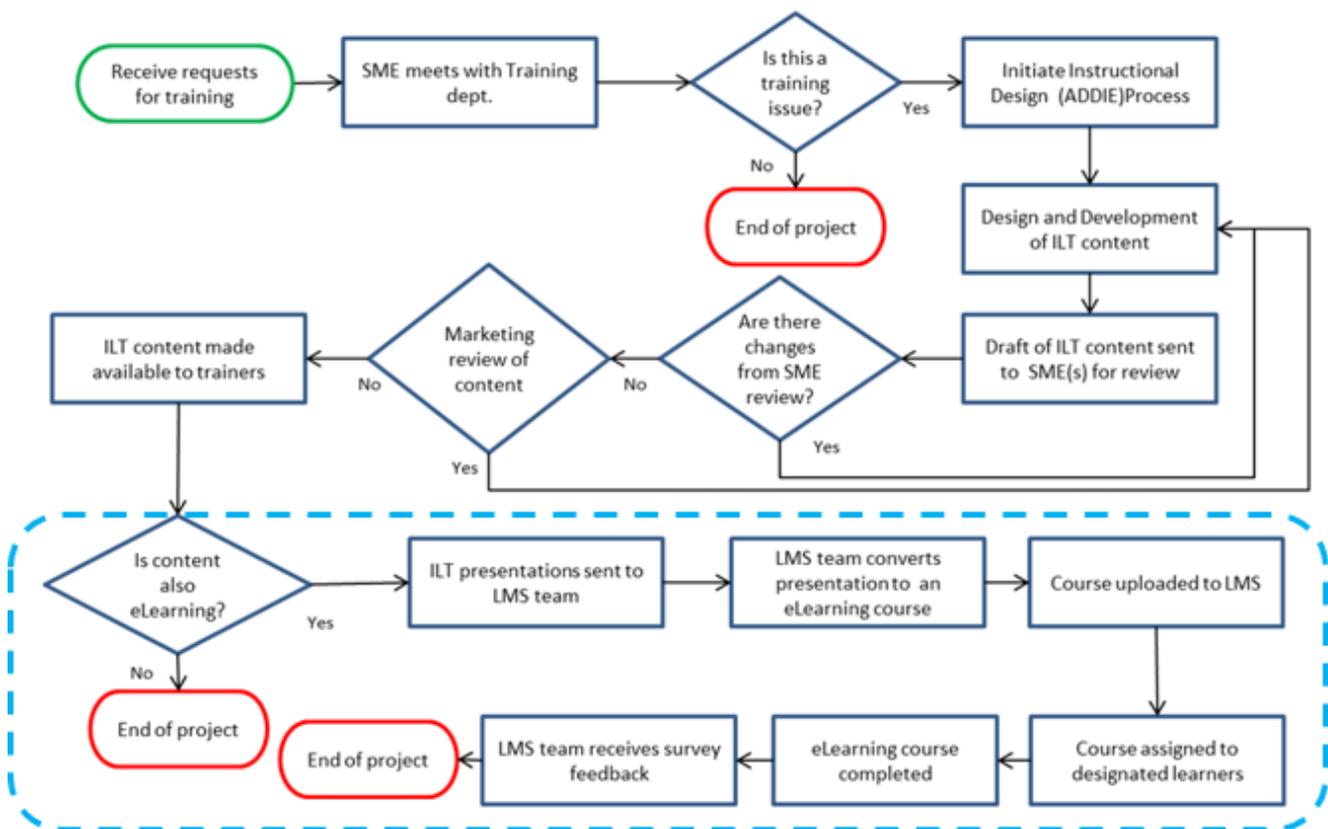
The addition of L&D instructional designers in the HR department required the development of an internal process for the development and review of e-learning content. Figure 4 is an illustration of the process for e-learning design and development within the L&D team, along with an internal process for the review of content.

Figure 4

Revised Instructional Design Process (L&D Team)
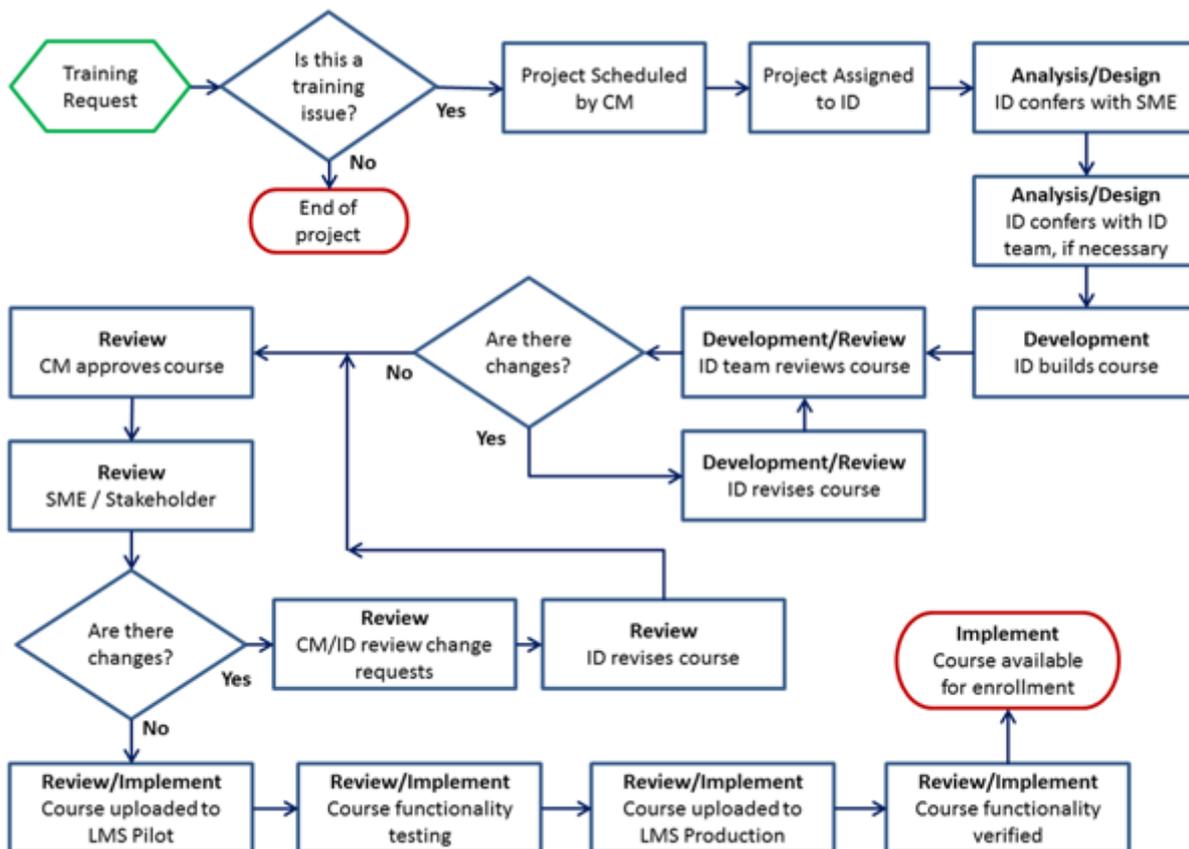
To standardize the evaluation phase a survey with uniform evaluation questions was included in every course in the LMS. Figure 5 contains details for the evaluation process of an e-learning course at Company A. The CM is responsible for implementing the steps of the evaluation process.

Figure 5

E-Learning Course Evaluation Process
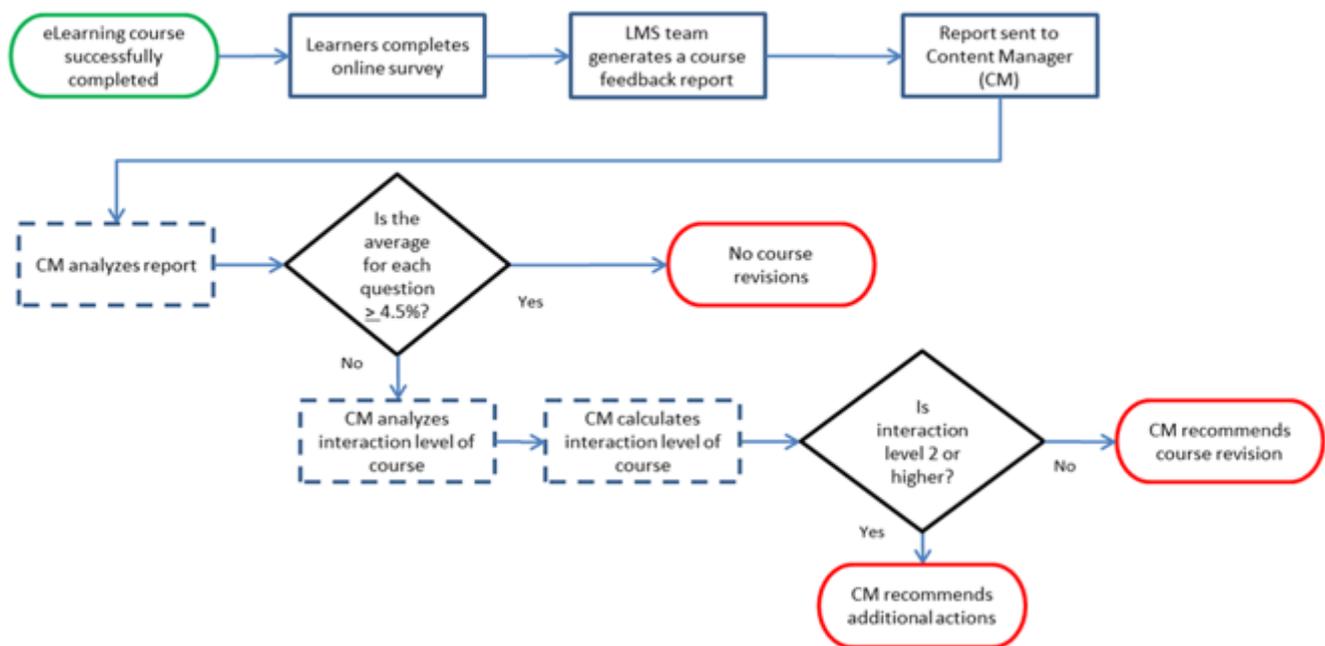
Standardized Forms for Gathering Requirements

Creation of learning activities in the LMS can be time consuming, especially if all details are not included with the initial request. Effective collaboration and communication are vital for success even in the analysis phase of an instructional design project (Klein & Kelly, 2018). A string of email threads and/or phone calls to clarify design and development specifications results in wasted time and possible errors. To remedy this situation, the CM met with the CM and LMS team to determine the types of required forms and the necessary information to be gathered on each form. The new requirements gathering forms allow for stakeholders to efficiently and accurately initiate the analysis phase of the ADDIE model. The three forms determined to be required were the Course Creation Request, the Section Request, and the Assignment Request forms.

The *Course Creation Request* form is applicable to any type of training to be created in the LMS, including e-learning courses. This form contains the basic information listed in the LMS about the training. The *Section Request* form serves a dual purpose. This form is used to create a classroom training course in the LMS, which included details such as Location and the Number of Students. Once a classroom course is created in the LMS, sections of this course must be created with specific dates and times. This form can be used to add sections to an existing classroom course, as well as create a new classroom course and sections. The *Assignment Request* form contains information about the learners and the training activities to be assigned. This form is the most widely used as assignments are requested at a higher rate than courses are created.

All forms were initially created in a PDF format and sent to the requestors as necessary. The requestors had difficulty submitting the forms and complained about the number of separate documents, so the forms were reformatted into a single Excel document. All forms are included on separate worksheets and instructions for completing the forms are also included in the Excel file.

Training for New Standardized Elements

The final stage of the e-learning program was training the decentralized instructional designers on the authoring software and basic e-learning principles. The instructional designers had previous experience in designing classroom presentations; however, making the transition to effective e-learning course design required additional instruction. The CM scheduled a two-day training session where the CM provided instruction on the process for converting a PowerPoint presentation into a basic e-learning course. Claro was used as the authoring software because no additional cost was required. On day one of the training, the CM provided instruction on the preparation of a PowerPoint file, the Claro interface, importing a PowerPoint file to Claro, and some basic functionality such as adding text boxes, images and audio. On day two, the instructional designers learned to create basic interactions, create an assessment, and publish the course for the LMS. An overview of the writing standards, Claro template, and review process were also discussed.

Results

This e-learning instructional design project resulted in new writing standards, new standardized instructional design processes, new forms for gathering e-learning requirements, and a set of templates to be used with authoring software to create uniform instructional materials across Company A. These e-learning program elements were deemed necessary to establish consistency in instructional design across a decentralized instructional design team. Such consistency facilitates flow and cognitive efficiency among the learners in the e-learning environment.

Writing Standards Guide

A Writing Standards Guide was created to ensure consistent standards of writing and interactions in the e-learning content. The writing standards document contains the most common writing issues encountered in e-learning development with the topics appearing in alphabetical order. Table 1 contains an example of one of the terms in the writing standards document.

Table 1

Example of Term in Writing Standards Document

Item	Description/Rule	Example
Appears	**Use appears as an intransitive verb; use displays as a transitive verb. Displays requires a direct object; appears does not.**	**Do: A message appears if you try to exit the application without saving the transaction. Don't: If you try to exit application without saving the transaction, a message displays. Do: Microsoft Windows displays a message if you do not log on correctly.**

Initially, instructional designers seemed unsure that they would be able to enact all the standards in their course creation. Therefore, the implementation of the standards has been an ongoing process that began with significant frustration by the designers; but time and experience has led to improved writing. As designers become more aware of the most common rules within the standards, the number of corrections has decreased; and their confidence has risen. Going forward, the CM has set a goal that e-learning content be 95% free of errors during the initial review.

Authoring Software Templates

The authoring software templates have made course development easier and more consistent. Developers can focus on course content and presentation rather than focusing on color schemes and navigation controls. The addition of JavaScript functions allowed the developers to personalize the instruction (Mayer, 2002) by using the name of the learner on various screens throughout the e-learning course.

Instructional Design Processes

Implementation of new instructional design processes sparked an initial learning curve. However, the stakeholders and course creators were able to adapt and adopt the processes without issue. The L&D team immediately embraced the new processes with no pushback. The decentralized instructional designers understood and accepted the new processes, but the utilization of the processes is limited as they do not currently create enough e-learning content to intuit the process. Time and additional experience with e-learning development should increase the use of the e-learning instructional design process among the decentralized instructional designers.

Requirements Gathering Forms

Reformatting the forms to a single Excel file has resulted in more frequent use by the course initiators/requestors and the LMS team. Figure 6 is an image of the Instructional worksheet in the Excel file. This worksheet serves as a cover sheet with instructions and descriptions of each of the forms.

Figure 6

Instructional Worksheet in Excel

	A	B	C	D	E	F	G	H	I
1									
2	**Instructions and Form Descriptions**								
3									
4	*Purpose:*	This file contains multiple worksheets that are used to create and maintain							
5		training content in the LMS. The appropriate forms must be completed before							
6		any course or assignment is created in the LMS. Below are instructions and							
7		descriptions of each form.							
8									
9	*Instructions:*	Each worksheet contains a specific form containing required information on							
10		the desired training. The fields in red are required, while the field in black							
11		are optional. All of the required forms must be completed for the training to							
12		be made available.							
13									
14	*Descriptions:*	1. Course Creation Request							
15		This form is required for ALL new training courses or content to be added to							
16		the LMS. There are fields on this forms for *Requestor Information*,							
17		*Course/Content Information* and *Course Settings*.							
18									
19		2. Section Request							
20		This form is *only required* for *Classroom* and *Webinar* training. Details about the							
21		initial classroom/webinar course are added to the LMS using the *Course*							
22		*Creation Request* form. Specific times, dates, and locations for the trainings are							
23		added using the *Training Section Request form*.							
24									
25		3. Assignment Request							
26		This form is required for any training content that is to be directly assigned to							
27		a group. The learners must be active in the LMS to receive the assignment.							
28									
29		Some of the required information on this form can be completed by the							
30		requestor, but direct contact with the LMS Team will ensure the assignment is							
31		compiled in an accurate manner.							
32									
33		An assignment from the LMS can be new or existing training content.							
34									

Figure 7 contains a partial image of the Course Creation Request form with additional instructions to the right of each field.

Figure 7

Course Creation Request Form in Excel

Figure 8 contains a partial image of the Section Request form with additional instructions to the right of each field.

Figure 8

Section Request Form in Excel

Section Request

Directions:	This form is used to request the creation of sections for a classroom training or webinar.
	The requestor must complete all of the RED fields in each section. The BLACK fields are optional.
Submit to:	thecompass@████████.com (at least two (2) weeks prior to class date)

Requestor Information

Department/Location:	
Date of Request:	
Contact Name:	
Contact Phone:	
Contact Email:	

Course Information

Course Title:			Title of the course as it appears in the LMS
Class Date:		Class Time Zone:	Date and Time Zone when the class will be conducted
Class Start Time:		Class End Time:	Start and End times for the class
Minimum # of Students:		Minimum # of Students:	Mimimum and Maximum number of students allowed in the class
Automatically cancel class if minimum number of students is not met?			
Registration Cut Off Date:			The last date allowed for registration

Figure 9 contains a partial image of the Assignment Request form with additional instructions to the right of each field.

Figure 9

Assignment Request Form in Excel

Training Evaluation

Training for the decentralized instructional designers was well received and appeared productive at the time. However, because these instructional designers do not currently create e-learning on a regular basis, refresher training may be required in the future. An evaluation of the e-learning training program was performed by the CM using the e-learning Maturity Model. Table 2 contains the results of the evaluation.

Table 2

eMM Evaluation

Measures	Level 1 Initial	Level 2 Planned	Level 3 Defined	Level 4 Managed	Level 5 Optimized
Student Learning	X	X			
Resource Creation	X	X	X		
Project Support	X	X	X		
Organization	X	X			

Student Learning reached level 2 maturity because the learner needs have been identified, but there is still not a formal strategy in place for future Needs Analyses. Resource Creation achieved level 3 maturity because there are policies in place to protect the intellectual property, but there is no system to properly catalog and reuse the intellectual property. Project Support was a level 3 maturity because the standards, templates and processes are in place but not fully adopted across Company A yet. Organization was a level 2 maturity because the company as whole has not developed an organizational vision for e-learning training. The L&D team has plans to market e-learning and LMS to the organization to increase this maturity level.

Conclusions

The purpose of this project was to standardize e-learning instructional design processes/tools and implement an e-learning training program to introduce new processes/tool to a decentralized instructional design team. Standardization of process/tools was sought to enhance the flow and cognitive efficiency of e-learning programs across the organization despite a decentralized

instructional design team. The new program included five sets of deliverables: authoring software templates, writing standards, requirements gathering forms, e-learning instructional design process, and training on the components of the program. These deliverables established necessary standards and structure where none existed previously. However, 11 months after initiating this project, the full functionality of these deliverables has yet to be realized. With the progression of time and experience using the new tools in the context of the ADDIE instructional design model, the L&D team and decentralized instructional designers should become more adept in the use of the new standardized processes and tools, advancing the maturity of the e-learning program at Company A.

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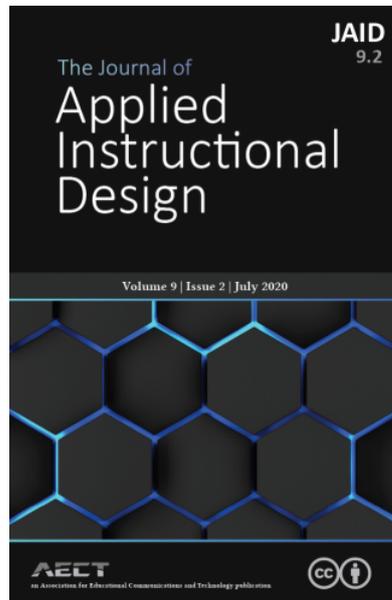
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