Building an Efficient e-Learning Team

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ABSTRACT

Faced with an ever-changing technical environment, the need to create effective and inspiring content, and in many cases, a shrinking budget, it is critical for eLearning managers to know how to build and maintain a technically savvy, creative, and cost-effective team. Producing and pricing engaging eLearning is a challenge that, in many instances, cannot be achieved using a one person/one authoring tool solution—it requires a team. Determining the correct mix of people is key to successfully delivering profitable and effective training.

In this paper, we will examine the actions required to meet these challenges, leveraging research data from leading industry sources. We will describe the characteristics and cost data associated with eLearning professionals—specifically, instructional systems designers, web programmers, and digital artists. We will examine the driving factors/differentiators for pricing training products. Finally, we will present an algorithmic solution for determining the correct mix of professionals required to design and develop eLearning content, given specifications such as interactivity level, complexity of subject, need for original visual media, amount of content, etc.

ABOUT THE AUTHORS

Dena Trammell is a senior learning professional and manager of training development for Science Applications International Corporation (SAIC). She has over 25 years of experience in multimedia design and over 10 years of experience in instructional systems design supporting multiple Department of Defense customers, including the U.S. Army, U.S. Air Force, and joint program offices. Ms. Trammell manages a large team of eLearning professionals, including instructional systems designers, programmers, graphic artists, and animators. She holds a bachelor's degree in art from the University of Alabama in Huntsville with minors in education and art history.

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INTRODUCTION

The correct mix of training professionals and experience levels is critical to achieving success in today's eLearning environment. In this paper, we will examine the actions required to meet these challenges.

The content of this paper is structured into three primary sections. The first section presents background information and definitions common to eLearning. The second section introduces the problem statement, defines the objectives, and describes the methodology and tools used to meet the stated objectives. The final section provides general findings and a conclusion.

BACKGROUND

eLearning Overview

In the broadest sense, eLearning refers to interactive courseware delivered to learners by way of electronic media. As with traditional, instructor or facilitator-led training, the priority is for the learner to gain a measurable level of mastery over the material being presented. Unique to eLearning, however, is that this mastery is achieved through interaction with a progressive series of self or group-paced multimedia-based assignments. “It includes the creation of story treatments, scripts, and storyboards. Interactive courseware may include, but is not limited to, text, programmed instruction, audiotapes, videotapes, slides, films, television, and computers” (TRADOC, 2013).

Levels of Interactivity

eLearning courseware is categorized into four levels of interactivity, defined by the degree to which the learner is required to interact with the material and the level of control given to the learner over the learning environment. The characteristics of each interactivity level are described below.

Table 1. Levels of Interactivity.

Description	Learner Environment	Content Type	Practice Level	Material Best Suited For
Level 1 - Basic	Passive and linear	Primarily knowledge or awareness based	No or very limited practice or feedback activities	Basic subject matter, short duration; Compliance training
Level 2 - Intermediate	Active, non-linear, and allows for basic control of the course environment	Primarily centered on rules and problem solving	Simple practice and feedback activities that are knowledge and/or identification based	Basic to mid-level subject matter; software training, soft-skills
Level 3 - Advanced	Active, non-linear, and utilizes simple branching	Primarily centered on application and transfer, utilizing scenarios and case studies	Complex practice activities that test multiple, interrelated concepts and provide detailed feedback and remediation	Mid-level to advanced subject matter; software, hardware, soft-skills, leadership

Description	Learner Environment	Content Type	Practice Level	Material Best Suited For
Level 4 - Highly-advanced	Extremely active, non-linear, and utilizes complex branching	Primarily centered on application, reflection, and transfer, utilizing realistic, scenario-based interactivity	Simulation-based practice activities that employ branching. Content is experienced, rather than presented (Carter, 2007)	Advanced subject matter; software, hardware, soft-skills, leadership

eLearning Professionals

The types of professionals and related skills typical to an eLearning production team are listed in the table below. For a large team, each role may represent stand-alone, full-time personnel. However, for many teams, cross-capability may be required, especially for secondary roles. Additionally, for most teams, administrative assistance may be required. For this study, only eLearning personnel and management roles are considered.

Table 2. Types of eLearning Professionals.

Role	Education/ Experience	Primary Tasks	Potential Secondary Role (in order of probability)
Primary Roles			
Instructional Systems Designer (ISD)	BS, MS, PhD – Instructional System, Adult Education, or similar	• Perform requirements analysis • Design learning approach • Design and develop content to meet required performance objectives/proficiencies • Develop course instructional content in the form of storyboards, scripts, lesson plans, learning aids, assessments, etc. • Perform and evaluate pilot testing	QA Reviewer Manager Digital Artist Videographer/ Photographer Narrator Programmer 3D Modeler
Digital Artist	BFA, BA, AS – Graphic Design, Art, Fine Art, Animation, or similar; portfolio	• Create original illustrations • Perform layout design • Create animations • Perform basic authoring tasks • Use graphic design and authoring software. • Develop and/or contribute to course design documents	Videographer/ Photographer 3D Modeler QA Reviewer Manager Programmer Instructional Designer
Secondary Roles			
3D Modeler	BFA, BA, AS – Art, 3D Modeling and Animation, or similar; portfolio	• Create original 3D models • Manipulate existing 3D models • Create animations	
Videographer/ Photographer	BFA, BA, AS – Art, photography/videography, or similar; portfolio	• Operate camera equipment • Edit video and photographs	
Programmer	BA, BS, AS – Computer programming or similar; portfolio	• Perform advanced programming/markup using HTML/HTML5, JavaScript, XML, CSS, and other programming languages/techniques • Develop and/or contribute to course design documents	
Narrator/Audio Editor	Experience in voice talent and access/familiarity with sound equipment and production	• Record narration and/or character audio • Edit audio to appropriate format	
Quality Assurance (QA) Reviewer	BA – English, Instructional Design, Technical Writing, or similar	• Review content for errors— grammatical, spelling, formatting, etc. • Ensure content clarity • Ensure functionality	
Manager	BA, BS, MA, MS – Instructional Design, Art, Management, etc.	• Maintain oversight of task including schedule and budget • Communicate status and requirements with customer and team • Assign tasking	
Subject Matter Expert	BA, BS, MA, MS – Subject specialty	• Provide technical/subject support • Verify accuracy of content	

BUILDING AN EFFICIENT TEAM

Scenario

Today's training managers are faced with an ever-changing technical environment and a marketplace requiring cost-effective, competitive solutions. Questions eLearning managers face include: “How do I ensure that I hire an appropriate mix of training professionals to meet my customer's educational and technical needs while keeping prices competitive?” And, “Is there a “one size fits all” solution?”

Objectives

The objectives of this paper are listed below:

- The primary objective is to describe a requirements-based, algorithmic approach to building an eLearning team.
- The secondary objective is to examine the technical and human factors driving the cost of training products.

Methodology

The structure of an eLearning team is conditional to the characteristics of the proposed courseware, which can widely vary from one effort to the next. For eLearning efforts that require use of existing media (such as clip art, media provided by the customer, and software screen shots) an ISD as a one-stop-shop may be an acceptable solution. However, when training requires significant amounts of new media creation, having a core team of cross-trained professionals is crucial to success. Hiring personnel who are equally proficient in digital art, programming, and instructional design may seem ideal, but these individuals are difficult to find and are often expensive. It is improbable that a training manager can staff an entire team with “triple threats” such as these, and, in reality, it is rarely the most cost-effective option. However, hiring ISDs who can also perform quality assurance tasks and narration, or finding digital artists who are able to create original artwork, 3D models, and animations, as well as perform basic programming/authoring tasks, is possible.

In addition to staffing the team with cross-trained personnel, building a team consisting of a mix of junior, mid-, and senior-level personnel in one or more primary role can produce a cost-effective team solution and ensure a trained team for the long-term.

Algorithmic Solution for Determining eLearning Team Requirements
Several steps are required to determine the correct mix of personnel to staff an eLearning team. The repeatable solution provided in this study includes the following:

- Perform initial requirements analysis
- Calculate the staffing requirements for each course
    - Assign baseline hours and baseline hours distribution by role
    - Adjust baseline for unique course needs, distributing adjustments by role
    - Total the course hours/distribution by role
- Total the staffing requirements for all courses
- Determine the staffing makeup

Perform Initial Requirements Analysis.
Given that each project is unique, a strong understanding of the requirements and customer expectations is necessary when determining the capabilities/personnel needed to complete the task. Considerations include, but are not limited to:

- Availability and maturity of existing content
- Availability of Subject Matter Expert (SME)
- Amount of original media required
- Anticipated hours of finished instruction
- Target platform/browser/Learning Management System (LMS) requirement

Collecting and analyzing the development requirements, using this or similar criteria, form the basis for determining the proper mix of eLearning professionals for each course, and, once all courses are considered, for the eLearning

team as a whole. The mix of personnel for interactivity level 2 training will differ greatly from the personnel to support an interactivity level 4 simulation (see Table 1).

Calculate the Staffing Requirements for Each Course.
Assign Baseline Hours and Baseline Hours Distribution by Role. Sources such as U.S. Army Pamphlet 350-70 and data from Chapman Alliance are good starting points for estimating the total labor hours required to produce training; however, it is important to remember that these references are averages. Consider the unique requirements for each project and make adjustments to the baseline in order to achieve a more accurate estimate. To begin estimating per course requirements, determine the base course hours using interactivity level as a guide.

U.S. Army Training and Doctrine Command (TRADOC) recommends the following base labor hour estimates per hour of finished instruction (TRADOC, 2013):

- Interactivity Level 1: 50 – 150
- Interactivity Level 2: 150 – 300
- Interactivity Level 3: 300 – 600
- Interactivity Level 4: 400 – 700

Considerations for selecting the appropriate baseline hours from the range of hours provided by TRADOC include the complexity of the subject matter and the experience level of the eLearning professionals who will execute the work. For example, it can be assumed that more experienced eLearning professionals will require fewer hours to complete an hour of training than less experienced staff, meaning an Interactivity Level 1 task executed by a senior ISD should be estimated using the lower value of 50.

Once the base labor hours are determined, role percentages may be derived from several sources or be based on past experience. For this study, percentages from Chapman Alliance are used. This source recommends unique distributions based on interactivity level. When using reference sources, such as Chapman Alliance, adjustments may need to be made for activities specified in the reference model that will not be performed. For example, Front End Analysis (FEA), Subject Matter Expert (SME), and Pilot Testing are included in Chapman Alliance reference model; however, in some instances, FEA is conducted by the customer and/or management prior to funding award or are considered marketing endeavors. Similarly, SME and Pilot Test functions may also be provided or performed by the customer. For the purposes of this study, the percentages for FEA, SME, and Pilot Testing from Chapman Alliance reference model are distributed to the *ISD*, *Digital Artist*, and *Programmer* categories (Chapman, B, 2010). The base-hours distribution for each role is calculated as:

$$Base\ Hours\ Distribution\ per\ Role = Recommended\ Role\ Percentage \times Base\ Course\ Hours \quad (1)$$

Adjust Baseline for Unique Course Needs, Distributing Adjustments by Role. The table below provides examples of adjustments to hours that may be required. These figures are a guideline; actual hours are dependent upon the topic complexity and the results of a completed requirements analysis. Apply adjustments for specialized tasking based on an initial requirements analysis and using estimates such as those found in Table 3. Note that several adjustments activities take place when developing the first hour of finished instruction, allowing the labor-hours requirement for subsequent hours to be reduced. The adjusted total is calculated as:

$$Adjusted\ Total = (Base\ Hours + Hour\ 1\ Adjustments) + ((Total\ Number\ of\ Course\ Hours - 1)(Base\ Hours + Hour\ 2\ Adjustments)) \quad (2)$$

Table 3. Sample Hours Adjustment Options for Specialized Tasks.

Role	Task	Estimated Additional Labor Hours per Hour of Finished Content
ISD	Extensive Requirements Analysis	40-120*
	Immature existing content	10-60
	Changing content	10-60
Digital Artist	Design Graphical User Interface (GUI)	40-80*
	Original artwork	20-80
	Original animations	40-120
	Changing content	20-60
	Immature existing content	20-60
	Video shoot	8-40 per shoot
	Video editing	20-80

Role	Task	Estimated Additional Labor Hours per Hour of Finished Content
3D Modeler	New 3D models	4-80 per model**
	Manipulate existing models	2-20 per model**
Programmer	Design course framework	20-80*
	Multiple target browsers	5 – 30 per browser/hour
	Multiple target platforms	40 - 80 per additional platform*
	Multiple target platforms	20-60 per additional platform ***
	Custom programming (simulations, activities, etc.)	80 – 160* 20 – 80 ***
	New technology requirements	40-120* 10-30***
	Learning Management System (LMS) posting	10-100 per course
Narrator/Audio Editing	Unique character animation	10-30
	Unique sound effects	5-20
	Correcting audio files	5-10
QA Reviewer	Multiple target platforms/devices/browsers	½ base QA amount times number of additional devices/platforms
Manager	Customer reporting cycles greater than 1 to 2/per month	5-20

* Apply to only the first hour of finished content. ** 3D modeling varies greatly depending upon the number and complexity of models (hardware, character, terrain, etc.). Measured per model, not by hour of instruction. *** Apply to hours 2 to x.

Total the Course Hours/Distribution by Role. By using a baseline hours-distribution and adjusting based on specific course needs, an estimate of the total course labor hours and the hours distribution per role can be obtained. Tables 4, 5, and 6 show example course hours distribution for a hypothetical eLearning team. Course A represents a 4-hour Interactivity Level 1 course, Course B represents a 12-hour Interactivity Level 3 course, and Course C represents an 8-hour Interactivity Level 2 course. Each course demonstrates how adjustments are made to calculate the hours required for each role, based on the findings of the initial requirements analysis. Details for these adjustments are contained in the notes column.

Table 4. Course A – Sample Interactivity Level 1, 4 Hour Course.

Description	Hrs	Role					Notes
		ISD	Digital Artist	Programmer	QA	Manager	
Base %*		35	31	17	8	9	Base percentage hours distribution
Base Rate per Hr Finished eLearning**	100	35	31	17	8	9	Base Distribution Interactivity Level 1
Hr 1 Addtl Labor Hrs			100	30	12		Special Requirements: Adjustment to labor hours for 1st hour of finished eLearning; Design Unique GUI - 60 hours (Digital Artist); Original Artwork - 40 hours (Digital Artist); 3 Target Browsers - 30 hours (Programmer) and 12 hours (QA)
Hr 1 Subtotal	242	35	131	47	20	9	Adjusted labor hours for 1st hour of finished eLearning - First hour subtotal
Hrs 2-4 Addtl Labor Hours			40	20	12		Special Requirements: Adjustment to labor hours for 2nd and subsequent hours of finished eLearning; Original Artwork - 40 hours (Digital Artist); 3 Target Browsers - 20 hours (Programmer) and 12 hours (QA)
Hrs 2-4 Subtotal	172	35	71	37	20	9	Adjusted labor hours for 2nd and subsequent hours of finished eLearning; Adjustment times number of hours
Subtotal	516	105	213	111	60	27	2nd and subsequent hours subtotal
Total	**758**	**140**	**344**	**158**	**80**	**36**	Final Distribution Interactivity Level 1 adjusted for special requirements
Revised %		**18%**	**45%**	**21%**	**11%**	**5%**	Final Percentage Hours Distribution

* Percentages based on Chapman Alliance (Chapman, B. (2010).* *Base total hours -United States, Department of the Army, Training and Doctrine Command. (2013).

Table 5. Course B – Sample Interactivity Level 3, 12 Hour Course.

Description	Hrs	Role					Notes
		ISD	Digital Artist	Programmer	QA	Manager	
Base %*		33	30	20	8	9	Base percentage hours distribution
Base Rate per Hr Finished eLearning**	425	140.25	127.5	85	34	38.25	Base Distribution Interactivity Level 3
Hr 1 Addtl Labor Hrs		90	20	60	48		Special Requirements: Adjustment to labor hours for 1st hour of finished eLearning Extensive Requirements Analysis - 60 Hours (ISD); Changing Content - 30 Hours (ISD), 20 Hours (Digital Artist); 3 Target Browsers - 60 (Programmer), 48 (QA)
Hr 1 Subtotal	643	230.25	147.5	145	82	38.25	Adjusted labor hours for 1st hour of finished eLearning - First hour subtotal
Hrs 2-12 Addtl Labor Hours		30	20	60	48		Special Requirements: Adjustment to labor hours for 2nd and subsequent hours of finished eLearning; Changing Content - 30 Hours (ISD), 20 Hours (Digital Artist); 3 Target Browsers - 60 (Programmer), 48 (QA)
Hrs 2-12 Subtotal	583	170.25	147.5	145	82	38.25	Adjusted labor hours for 2nd and subsequent hours of finished eLearning; Adjustment times number of hours
Subtotal	6996	2043	1770	1740	984	459	2nd and subsequent hours subtotal (11 hrs)
Total	**7639**	**2273.25**	**1917.5**	**1885**	**1066**	**497.25**	Final Distribution Interactivity Level 1 adjusted for special requirements
Revised %		**30%**	**25%**	**25%**	**14%**	**7%**	Final Percentage Hours Distribution

* Percentages based on Chapman Alliance * *Base total hours from Army IMI Pricing TRADOC 350-70

Table 6. Course C – Sample Interactivity Level 2, 8 Hour Course.

Description	Hrs	Role					Notes
		ISD	Digital Artist	Programmer	QA	Manager	
Base %*	100	37	28	18	6	11	Base percentage hours distribution
Base Rate per Hr Finished eLearning**	225	83.25	63	40.5	13.5	24.75	Base Distribution Interactivity Level 2
Hr 1 Addtl Labor Hrs		20	112	130	36		Special Requirements: Adjustment to labor hours for 1st hour of finished eLearning; Immature Existing Content - 20 Hours (ISD); Original Artwork - 40 hours (Digital Artist); Video Capture - 32 hours (Digital Artist); Video Editing - 40 hours (Digital Artist); Mobile Device Application and Web Delivery - 100 hours (Programmer), 18 (QA); 2 Target Browsers - 30 (Programmer), 18 (QA)
Hr 1 Subtotal	523	103.25	175	170.5	49.5	24.75	Adjusted labor hours for 1st hour of finished eLearning - First hour subtotal
Hrs 2-8 Addtl Labor Hours		20	40	70	36		Special Requirements: Adjustment to labor hours for 2nd and subsequent hours of finished eLearning; Immature Existing Content - 20 Hours (ISD); Original Artwork - 40 hours (Digital Artist); Mobile Device Application and Web Delivery - 50 hours (Programmer), 18 (QA); 2 Target Browsers - 20 (Programmer), 18 (QA)
Hrs 2-8 Subtotal	391	103.25	103	110.5	49.5	24.75	Adjusted labor hours for 2nd and subsequent hours of finished eLearning; Adjustment times number of hours
Subtotal	2737	722.75	721	773.5	346.5	173.25	2nd and subsequent hours subtotal
Total	**3260**	**826**	**896**	**944**	**396**	**198**	Final Distribution Interactivity Level 1 adjusted for special requirements
Revised %		**25%**	**27%**	**29%**	**12%**	**6%**	Final Percentage Hours Distribution

* Percentages based on Chapman Alliance * *Base total hours from Army IMI Pricing TRADOC 350-70

The totals for each role, along with the information displayed in the notes column, are critical to selecting the appropriate skills for the eLearning team and identifying areas where cross-training may be required. Of particular interest in these examples are the requirements for video capture and editing, mobile device programming, and Learning Management System (LMS) knowledge. These specialized, secondary roles (refer to Table 2) will need to be addressed when staffing and assigning tasks for this eLearning team.

Total the Staffing Requirements for All Courses.
By estimating the composite of all courses, a yearly distribution of hours by role may be estimated, and this estimation may be used to determine the appropriate makeup of the eLearning team. The total hours per role is derived by totaling the role-hours for all courses and dividing by the total amount of hours for the duration of training development. Table 7 depicts the Full-Time Effort (FTE) per role for the sample eLearning team for one year. Six FTE will be required to produce the three sample courses if course development occurs over a one-year time frame.

Table 7. Courses A, B, and C Totals and Resulting Labor.

Description	**Hrs**	**Role**					**Total Team**
		ISD	**Digital Artist**	**Programmer**	**QA**	**Manager**	
Course A - Totals	758	140	344	158	80	36	
Course B - Totals	7639	2273.25	1917.5	1885	1066	497.25	
Course C - Totals	3260	826	896	944	396	198	
Total Labor Hours	11657	3239.25	3157.5	2987	1542	731.25	
Distribution		28%	27%	26%	13%	6%	
Total FTE by Role*		**1.69**	**1.64**	**1.56**	**0.80**	**0.38**	**6.07**

*Based on 1920 labor hours per year

Determine the Staffing Makeup.
With staffing requirements calculated, analysis of the data is required to determine the team makeup. When using this process for calculating the required staff, it is rare for the FTE by role to result in whole numbers, meaning flexibility and cross-training across roles is critical to meeting the requirements of all the courses. Additionally, the unique requirements identified in the initial requirements analysis (notes column of Tables 4-6) must be addressed. When standing up a new team, writing appropriate job descriptions that include the secondary roles as well as primary roles (Table 2) allow selection of a team that possesses all the skills required to complete the tasking. When assigning tasks to an existing eLearning team, select personnel possessing the correct mix of skills or provide mentorship and/or training opportunities to allow the individual(s) to learn the needed skills. The six individuals required to complete the tasking in this example could be one of several potential combinations, including the following possible staffing solution:

- ISD with management capability
- Instructional Systems Designer (ISD) with some authoring and graphic design capability
- Digital Artist with video production/editing capability
- Digital Artist with authoring and programming capabilities
- Digital Artist with ISD and quality assurance capabilities
- Programmer with LMS and mobile device programming capabilities

In addition to cross-training, a mix of experience levels may also be implemented. Staffing an eLearning team with a mix of experience levels may afford opportunities for cost savings. For purposes of this study, a *Mixed Team* is comprised of a combination of junior, mid-level, and senior-level eLearning professionals. The *Smaller, Highly-Experienced Team* is comprised of fewer personnel, all at mid- or senior- experience levels.

Figure 1 shows the cost benefit of mixing experience levels with a comparison of two hypothetical eLearning teams, each using reference role percentage distribution (Chapman, B, 2010) and 600 labor hours per hour of finished content (TRADOC, 2013). Labor costs are calculated using generic hourly rates for illustrative purposes.

Resource/Task	Labor Hours per 1 hour developed content	Percentage*	Cost/Hour	Cost/person /finished hour	Cost Differential	Total Yearly Course Hours Required to Support Staff Member	Average number of hours needed per year to support mixed staff (Artist, Programmer, ...)
Mixed Team							
Digital Artist (Junior)	150	25.00%	50	$7,500		12.8	
Digital Artist (Senior)	60	10.00%	100	$6,000		32.0	
Programmer (Senior)	108	18.00%	100	$10,800		17.8	21.5
ISD (Junior)	150	25.00%	50	$7,500		12.8	
ISD (Senior)	60	10.00%	100	$6,000		32.0	
QA (Mid)	36	6.00%	75	$2,700		53.3	
Project Mgr	36	6.00%	120	$4,320		53.3	
Labor Total	600	100.00%		**$44,820**			
Smaller Highly Experienced Team							
Digital Artist (Mid)	210	35.00%	75	$15,750		9.1	
Programmer (Senior)	108	18.00%	100	$10,800		17.8	12.0
ISD (Senior)	210	35.00%	100	$21,000		9.1	
QA (Mid)	36	6.00%	75	$2,700		53.3	
Project Mgr	36	6.00%	120	$4,320		53.3	
Labor Total	600	100.00%		**$54,570**	$9,750	*Cost Difference*	
					17.87%	*Percent Cost Savings using Mixed Team*	

Figure 1. Comparison of Team Composition and the Effect of Team Composition on Pricing and Required Volume of eLearning Production per Year.

Using a mixed team results in a 17.87% cost savings per hour of finished eLearning. By using a combination of senior and junior personnel for the digital artist and ISD roles, it is expected that the senior professional will guide the junior personnel and ensure quality production. When the smaller, highly experienced team is used, the cost per hour is higher but the risk associated with using junior personnel is eliminated. Of note is that the number of course hours per year to support the *Mixed Team* is 56% greater due to the larger team size. In order to achieve the cost benefit of a *Mixed Team,* adequate workload is required to support the additional personnel.

Analysis of Actual Course Data

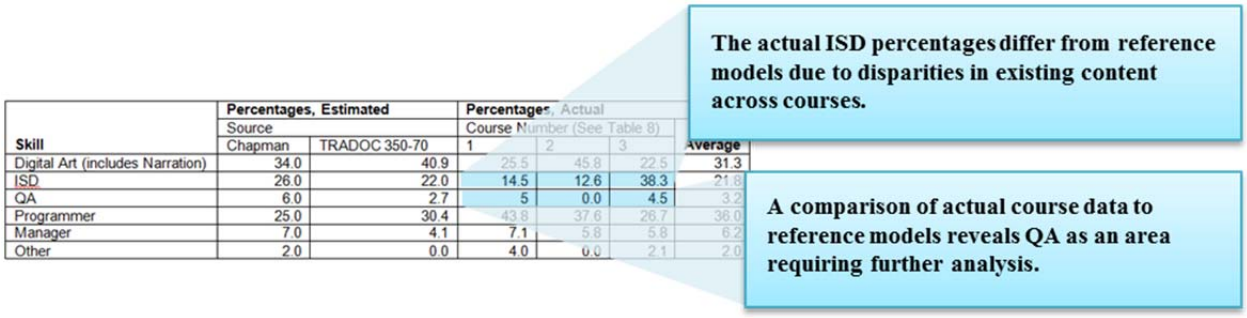
The process described in this studyprovides a repeatable approach for determining eLearning team staffing requirements. Collecting and analyzing actual project data can provide insight into successful (and unsuccessful) staffing approaches for a particular team. Reviewing actual data can also reveal trends and requirements unique to a particular student population and may bring to light opportunities for improvement and greater efficiency.

Table 8 and Figure 2 provide examples of collected course data. Table 8 provides detailed information for each of the studied courses. Figure 2 performs a comparison of the actual data to the suggested guidelines found in reference sources (TRADOC, 2013 and Chapman, B. (2010).

Table 8. Sample Course Details – Source SAIC AMCOM Express Contract.

Course No.	Interactivity Level	Existing Content Availability	Media Requirements	SME Availability	Target Delivery
1	Level 4	Available technical manuals	Technical content (hardware); All new graphics including 3D modeling	Good	Local .exe and mobile application delivery; Run-time 2 hours
2	Level 1 introduction (15% of run-time) and Level 4 (85% of run-time)	Customer provided design document	All original graphics; Heavy programming (game)	Good	Run-time 1 hour
3	Blended solution –Level 2/3, ILT materials, Virtual Interactive Exercises (Level 4), and networking functions for student/ instructor workstations	Insufficient technical documentation	Heavy 3D modeling/hardware and software simulations	Good	Run-time – eLearning 3 hours, VIE 3 hours

A comparison of sample course data to reference models for interactivity levels 3 and 4 (Figure 2) reveals that the actual percentages closely align in most categories. Categories that differ include *Programming* versus *ISD* percentages. To explain the differences, referencing the course data (Table 8) indicates that, in the case of Course 2, the customer provided a detailed design document, negating much of the need for ISD services. Conversely, course Course 3, a blended-learning course, required ISD hours greatly exceeding the reference model, largely due to insufficient technical documentation and the need for ILT materials in addition to eLearning.



Skill	Percentages, Estimated		Percentages, Actual			
	Source		Course Number (See Table 8)			
	Chapman	TRADOC 350-70	1	2	3	Average
Digital Art (includes Narration)	34.0	40.9	25.5	45.8	22.5	31.3
ISD	26.0	22.0	14.5	12.6	38.3	21.8
QA	6.0	2.7	5	0.0	4.5	3.2
Programmer	25.0	30.4	43.8	37.6	26.7	36.0
Manager	7.0	4.1	7.1	5.8	5.8	6.2
Other	2.0	0.0	4.0	0.0	2.1	2.0

Figure 2. Interactivity Levels 3 and 4 – Comparison of Sample Course Data to Recommendations from Chapman Alliance and Army TRADOC Pamphlet 350-70.

Comparing course data to resource model data can identify potential deficiencies. For example, *Quality Assurance* for all courses falls below the percentage recommended by Chapman Alliance. It should be noted that quality assurance may have been performed as part of the duties of other personnel, making it difficult to quantify; however, the analysis flags quality assurance as an area requiring attention.

CONCLUSION

In this paper, we demonstrated a repeatable process for estimating the staffing requirements for an eLearning team. The implementation of this process, in most instances, reveals the necessity of building a cross-trained, multidisciplinary team of eLearning professionals.

Additionally, by comparing different team compositions, this paper shows that a team composed of personnel at incremental experience levels can be an effective staffing technique given adequate workload.

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