BTSD COST ESTIMATION MODELS REPORT (WBS 253)

April 12, 2022

Consultancy Services to Develop, Implement and Execute a Human Resource Strengthening Plan

Belize | Ministry of Finance

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LIST OF ACRONYMS

ADDIE	Analyze, Design, Development, Implementation (aka Deliver) and Evaluation
ATD	Association for Talent Development
BTSAT	Belize Tax Services Advisory Team
BTSD	Belize Tax Service Department
C2D	Catalyst to Development (C2D Services)
HRD	Human Resources Development
HRM	Human Resources Management
ID	Instructional Designer
ILT	Instructor-Led Training
LDW	Learning Design Worksheet
PM	Project Manager
QA	Quality Assurance
SME	Subject Matter Expert
TNA	Training Needs Analysis
TOR	Terms of Reference
US	United States
WBS	Work Breakdown Structure

1   Phase 200/Assessment

During Phase 200/Assessment, Catalyst for Development (C2D) Services will conduct competency assessments on three key tax profiles within the Belize Tax Service Department (BTSD): Tax Auditor, Tax Collector and Taxpayer Services Inspector. In addition, a fourth competency assessment will be provided for all BTSD staff not engaged in working in one of the three tax profiles. The Phase 200/Assessment will also evaluate the status of the BTSD human resources and training expertise and practices. This will allow the BTSD and C2D to set the project methodology, tools, outputs, and timeline for BTSD instructors to deliver three courses on the agreed upon eLearning platform (Moodle). The identification of the BTSD's human resources and training issues and challenges, along with their root causes, will guide C2D in determining how best to address them to avoid any new issues being created with the implementation of eLearning at the BTSD. This will help in formulating options in terms of strategy and organization. This phase culminates with the Assessment Report (WBS 260) which will include a BTSD Training Plan to close the identified performance gaps for all BTSD staff.

1.1 Phase 200/Proposal

Per the C2D Proposal, the specific objectives of the BTSD Cost Estimation Model (WBS 253) are as follows:

> *"Per the Terms of Reference (TOR), the Consultant must provide costs for each learning program and map out long-term training plans (5.1.7). However, many factors go into determining training costs. Therefore, we are proposing that we provide the BTSD with a model to determine costs rather than provide a budget with numerous assumptions that may or may not be realistic.*

> *The model for cost estimation will evaluate effort and time required to develop the trainings based on industry-leading research conducted by The Chapman Alliance and the Association for Talent Development (ATD). The cost estimation model considers the type of training to be delivered, the level of complexity and the stability of the subject matter."*

1.2 Phase 200/WBS 253

Per WBS 253, C2D should "develop [a] Model so that BTSD can determine the cost of each program." At the end of Phase 200/Assessment, C2D will provide a Training Plan along with three eLearning course recommendations. It will then be incumbent upon the BTSD to determine which remaining courses could be provided by Donors, Vendors or produced internally by the BTSD. To assist the BTSD in determining their Training Budget, C2D will provide two Cost Estimation Models to support them in determining the cost for internal training:

› eLearning Cost Estimation Model

› Instructor-Led Cost Estimation Model.

The remainder of this report will address the ADDIE Model along with the Kirkpatrick Evaluation Model and the two Cost Estimation Models.

2   Models, BTSD Training Plan and Budget

Before introducing the BTSD Cost Estimation Models, it is essential that the BTSD understands the ADDIE Model and the Kirkpatrick Evaluation Model and their correlation to building the BTSD Training Plan and ultimately, the BTSD Training Budget. The ADDIE Model provides the BTSD with a foundational and proven framework to follow to build and deliver training that will close the identified gaps between current and desired staff performance while the Kirkpatrick Model provides the BTSD with a protocol to determine if provided training has improved individual, departmental and organizational performance.

2.1 ADDIE Model

Per the Inception Report, "Our approach to the development of training material is based on the ADDIE Model which is composed of five main stages: Analyze, Design, Development, Implementation (Delivery) and Evaluation. Additionally, given the importance of assessment, review or evaluation processes will be used throughout the stages. The Belize Tax Services Advisory Team (BTSAT) along with the BTSD instructors will work collaboratively with the C2D Team throughout the stages to ensure knowledge transfer and sustainability."

Note: The five stages of the ADDIE Model outline the key tasks that are to be delivered within each phase and how they contribute to the development of the project. Understanding the cost behind each task produced and the rationale behind will guide the BTSD in determining the overall cost of training. The following section addresses each phase of the ADDIE Model in more details than originally shared in the Inception Report.

<p align="center">Figure 1 | ADDIE Model</p>

1. Analyze

The first step will be to establish the nature of the skills targeted and the learning requirements. The Project Team will analyze the profile and characteristics of the learners and of the current learning environment to examine the potential for success of the learners who will follow the different training, as well as the possible environments in which training could take place. The Analysis Phase is crucial as the training can only be as good as the foundation it is built on.

Note: C2D produced four Competency Profile Surveys to collect data from BTSD staff along with collecting data on BTSD's current HRM and HRD environment. After analyzing the results, C2D will provide a BTSD Training Plan along with three recommended courses for BTSD staff based on the performance gaps identified during the Competency Profile Surveys, HRM and HRD Assessments.

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2. Design

In this phase, the Project Team will design the content and structure of the training courses. The Project Team will select an appropriate format, communication medium and instructional strategy for the training program that ensures it is addressing the program's objectives, as well as the learning environment and any issues identified in the analysis. By the end of this stage, the team will have the skeleton of the training program: the Learning Design Worksheet (LDW).

Note: Moodle has been selected to be the tool to design and host the three BTSD eLearning courses. C2D will work along with the five to ten selected BTSD staff to design the three courses using the LDW. This will provide the BTSD with "real time" data to design an eLearning course.

3. Development

During the Development Phase, the Project Team will produce and test the methodology. While the first two steps are all about planning and brainstorming, at this stage the LDW from the design stage is developed into a course. The developed material will go through a formative evaluation process to ensure its quality and usability. By the end of this stage, the entirety of the training material will be developed and finalized.

Note: The BTSD Instructors will work along with the C2D Project Team to develop the three courses using the LDWs. Following the full development and testing of all three eLearning courses, the BTSD will have actual data on the time needed to build and test three ten-hour eLearning courses.

4. Implement (Deliver)

At this stage, following the training program design laid out in the previous stages, training and support will be offered to the learners or participants.

Note: The BTSD instructors will receive training and will have time to practice delivering their assigned eLearning courses. They will also deliver the three eLearning programs, providing the BTSD with data on the time needed to prepare and deliver eLearning training.

5. Evaluate

To meet the training objectives, assessments and reviews will take place throughout the instructional design process which includes the following tasks:

⟩ **Internal Evaluations** — The Project Team will carry out continuous evaluations of each phase.
⟩ **External Evaluations—**Testers or Quality Assurance Managers will check for usability so that training courses are truly designed around the learner.
⟩ **Course Revisions—**Based on evaluation feedback, improvements will be made in training courses.

2.2 Kirkpatrick Evaluation Model

In the Evaluation stage of the ADDIE Model, Instructional Designers evaluate the training solution to assess the level of effectiveness of the training and evaluate if the learners or participants have reached the learning goals that were initially established in the Design Phase. The most widely used Evaluation Model is the "Kirkpatrick Evaluation Model", which is composed of four levels assessing different components of the learning program through a series of questions. Below is a graphic representation of the Kirkpatrick Evaluation Model:

Figure 2 | Kirkpatrick Evaluation Model [1]

Overview of Kirkpatrick's Four-Level Training Evaluation Model

Results
The degree to which targeted outcomes occur as a result of the training and the support and accountability package

Behavior
The degree to which participants apply what they learned during training when they are back on the job

Learning
The degree to which participants acquire the intended knowledge, skills, attitude, confidence and commitment based on their participation in the training

Reaction
The degree to which participants find the training favorable, engaging and relevant to their jobs

Source: Donald Kirkpatrick

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[1] Overview of the Kirkpatrick Model and foundational principles. (2020, April 27). Retrieved March 30, 2022, from https://kloudlearn.medium.com/overview-of-the-kirkpatrick-model-and-foundational-principles-1d9a349a9ae3

The four levels of evaluation are described below:

> **Level 1: Reaction**

This level aims to evaluate how the learner received the training by assessing their level of engagement and general perception of the experience.

> **Level 2: Learning**

This level aims to evaluate the amount of knowledge and learning that occurred as a result of the training. The goal in this level is to understand if the training contributed to bridging or closing the gap between the initial knowledge, skills, and attitudes of the learner and the desired knowledge, skills, and attitudes.

> **Level 3: Behavior**

This level aims to evaluate how well the learner applies the training into their daily lives. At this level, the goal is to establish if the behavior of the learner has changed and improved and if they put into practice what they have learned in their environment.

> **Level 4: Results**

This level aims to evaluate the direct results of the training and the impact and effect on the entire organization, or at the business level.

Note: Based on evaluation feedback, the C2D instructors will be tasked with improving the three training eLearning courses based on all conducted evaluations before they are delivered again to the BTSD staff.

2.3 BTSD Training Plan and Budget

To build the BTSD Training Plan, the C2D team will collect information about the gaps between the current performance, skills, and attitudes of their employees and the desired performance, skills, and attitudes delivered through the professional survey tool, Survey Monkey. The data collected in the Assessment Phase will be used to help identify training and skills development activities that can contribute significantly to the narrowing of identified gaps. This will provide a comprehensive portrait of the BTSD learners and their learning needs. C2D also collected environmental information on the BTSD's Human Resources Management (HRM) and Human Resources Development (HRD) Units.

At this stage, and in collaboration with the BTSD, the BTSD Training Plan will be carefully mapped out as the details relative to its design, development and delivery are established. Outlining the Training Plan and providing abbreviated Course Outlines will provide the BTSD with the information they need to determine the cost behind each task per phase of development that is required to bring the courses to fruition. In addition, a proposal will be developed to consider opportunities to bridge gaps through HRM and HRD development strategies.

In the remainder of this report, C2D will outline how the BTSD can determine course cost estimations through the delivery of a Cost Estimation Model. Proposing a Cost Estimation Model rather than a budget to determine the costs for an eLearning solution is a more realistic approach since it allows for more flexibility versus providing a fixed budget that may not consider unpredictable outcomes, such as iterations and changes, which are inevitable in any course development.

3   Cost Estimation Models

As previously mentioned in this report, several factors go into determining training costs. These factors are relative to the scope and size of the training, its delivery schedule and other factors that influence the level of effort and time required for the overall design and development of the training program. Several sophisticated eLearning Cost Estimation Models are available and offer different viewpoints on how to arrive at the most accurate cost estimate for an eLearning training. Among these models, very few provide specific information about the rationale that drives their reasoning, and even less data to support their claims. In fact, these models do not provide specific information about design details as they usually provide a rough estimate that is quite general.

For this reason, C2D Services recommends the Cost Estimation Model from **"The Chapman Alliance and the Association for Talent Development (ATD)".** The Chapman Alliance and the ATD is an industry-leading research association that provides strategic intelligence and initiatives to businesses that want to choose the most appropriate learning technology to design learning interventions that support their training needs. The Cost Estimate Model outlines design details with a high level of precision by establishing a ratio of the estimated cost for a task per its time of development, while considering its level of complexity, ranging from low level or basic eLearning (Level 1) to more complex simulations (Level 3).

In addition to its level of clarity and precision, this model is based on learning development metrics that stem from the results of research conducted within a community of more than 3,000 learning development experts from various organizations and companies. These professionals have experience creating learning content via training that has reached over approximately 20,000,000 learners[2] worldwide.

3.1 eLearning Cost Estimation Model

According to the Chapman Cost Estimation Model and the Association for Talent Development Model for eLearning pricing, the complexity of eLearning solutions can vary depending on their level of complexity and interactivity. The three levels of complexity range from Level 1 eLearning, or the basic and most simple eLearning intervention, to Level 3 eLearning, or the most advanced and highly interactive level of eLearning.

›   **Level 1 eLearning** (low complexity) includes content pages, text, simple graphics, and test questions for evaluation. Essentially, this level involves PowerPoint pages turned into an eLearning tool used for training purposes.

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[2] Chapman, B. (2010). How Long Does it Take to Create Learning? [Research Study]. Published by Chapman Alliance LLC. http://www.chapmanalliance.com/howlong/

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› **Level 2 eLearning** (average complexity) is considered Level 1 eLearning that is 25% more interactive since it includes online modules that have more interactive activities and contain more multimedia elements. These modules may have more video and audio, as well as animation, transitions, and more interactive activities. This level involves simple interactive video capsules and modules and interactive quizzes aimed to assess the learner's comprehension of the covered material. At this level, there are more and more activities that allow learners to test their skills and knowledge, such as drag and drop or software simulations. These modules are widely used and the most common in organizational trainings.

› **Level 3 eLearning** (advanced complexity) involves the production of highly interactive learning interventions that involve complex simulations, serious gaming, animated video, and virtual/augmented reality learning content that includes elements of play or edutainment. This level of eLearning requires an extensive level of graphic production.

C2D ELEARNING COST MODEL RECOMMENDATION

C2D recommends the BTSD to develop **Level 2 eLearning** training, since this level of development strikes a good balance between a rich learning experience for learners or participants and a reasonable development time. This level of eLearning development corresponds to the cost related to tasks that allow the deployment of Moodle, an asynchronous learning platform centered on the learner's needs. It also allows learners to access all the self-training content they require to complete a course that can be complemented by instructor-led training, which is required in the Training Plan of the BTSD. In the table below, the Chapman Alliance Model provides an assessment of the development costs for a **Level 2 eLearning** training.

Table 1 | Chapman Alliance Cost Estimation Model for Level 2 eLearning

ChapmanAlliance
PASSIONATE ABOUT INNOVATIVE LEARNING

Development of Level 2 eLearning
Combining <u>Average Time</u> and <u>Average Cost</u> to Estimate Development Costs

Tasks	% of time spent on each task	Time spent on each task (per finished hour)	1-hour Level 2 eLearning	5-hours Level 2 eLearning	10-hours Level 2 eLearning
Front End Analysis	9%	17.36	$ 1,753	$ 8,767	$ 17,535
Instructional Design	13%	24.69	$ 2,493	$ 12,466	$ 24,932
Storyboarding	11%	20.88	$ 2,108	$ 10,542	$ 21,085
Graphic Production	12%	22.39	$ 2,261	$ 11,305	$ 22,609
Video Production	6%	11.29	$ 1,140	$ 5,700	$ 11,400
Audio Production	6%	11.59	$ 1,171	$ 5,855	$ 11,710
Authoring/ Programming	18%	32.20	$ 3,252	$ 16,260	$ 32,520
QA Testing	6%	11.88	$ 1,200	$ 5,998	$ 11,996
Project Management	6%	11.74	$ 1,185	$ 5,926	$ 11,853
SME/ Stakeholder Reviews	6%	10.96	$ 1,107	$ 5,533	$ 11,066
Pilot Test	4%	7.41	$ 748	$ 3,740	$ 7,481
Other	1%	1.63	$ 164	$ 822	$ 1,644
Totals	100%	184	$ 18,583	$ 92,915	$ 185,830

Variables:
* Average time of development per finished hour of Level 2 eLearning: **184**
** Average cost of development for 1 finished hour of Level 2 eLearning: **$18,583**
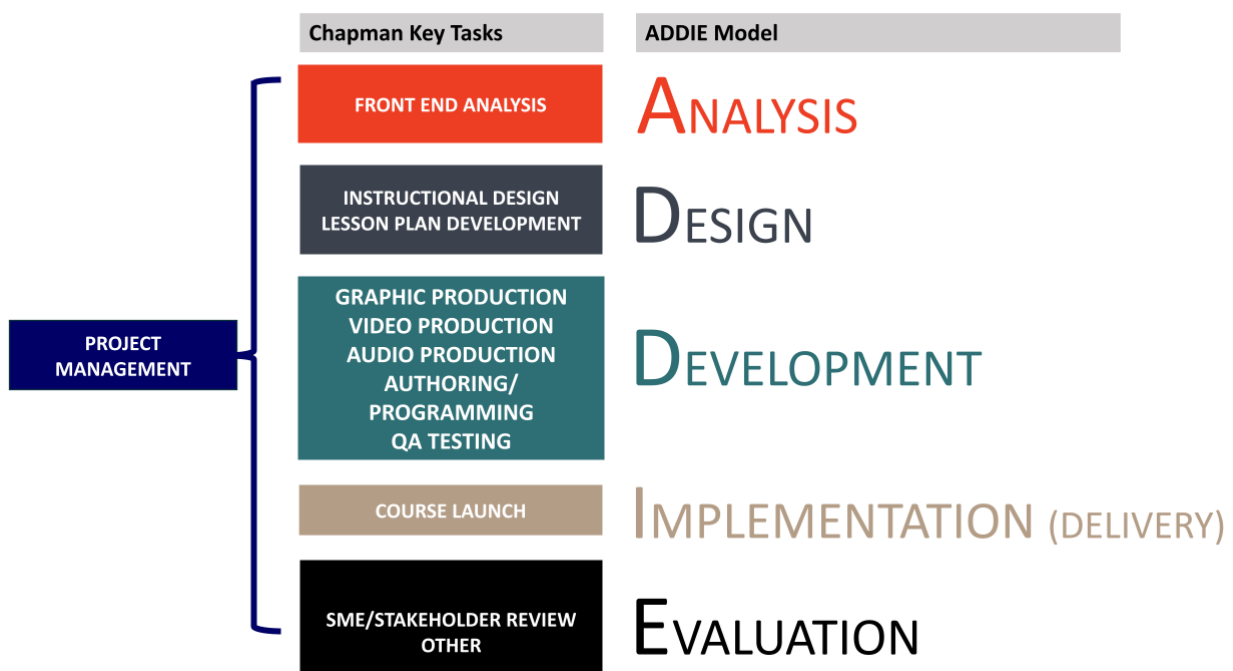
NOTE: The numbers above assume that all tasks are repeated for each hour of instruction. The study did not explore the efficiency and reduction of time for longer courses by task.

Research data collected: September 2010, by Chapman Alliance

As described in the Chapman Model included on the previous page, the average time of development per finished hour of a **Level 2 eLearning** solution is 184 hours. Depending on the quality of the course, the time of development may vary. **To provide an accurate cost estimate, it is important for the BTSD to track the amount of time spent on each development task.** Along with this consideration, it should be noted that the Model cites cost in the United States (US) dollars. Therefore, the cost for one hour of eLearning would be $37,166 in Belize dollars.

Note: All amounts cited in the table on the previous page are based on a USD 100/hour cost which may not be the same cost for the BTSD. Therefore, the BTSD should track and adjust these amounts accordingly when completing the Cost Estimation Model Template provided by C2D. The remaining two eLearning Cost Models can be found in the Appendix.

Figure 3 | Chapman Alliance Cost Model for eLearning vs. ADDIE Model

Tasks related to project management occur throughout all the stages of development (Analysis to Evaluation). A definition of key tasks per the Development Phase of the ADDIE Model is presented below:

ANALYSIS PHASE

In the "Analysis" phase of the ADDIE Model, the key tasks involve the following:

> **Front-end Analysis:**

Front-end Analysis refers to the tasks performed to conduct an in-depth analysis of the learners and their training needs. This phase includes using methods, processes, and tools to determine the gaps between the current performance (knowledge, skills, or attitudes or behaviors) and desired performance (knowledge, skills, or attitudes or behaviors) that are to be achieved as a result of the training course. The tasks related to Front-end Analysis include the production of a Training Needs Analysis (TNA) and other types of assessment, such as the surveys to collect data and insight on the learners and their work environment.

DESIGN PHASE

In the "Design" phase of the ADDIE Model, key tasks involve the following:

> **Instructional Design**

The key tasks relative to Instructional Design involve the choice of appropriate instructional methods and the establishment of learning objectives that will guide the development and delivery of training learning materials. C2D's courses are designed using an instructional strategy specific to distance education. This mode of training allows learners to learn at their own pace, with relative autonomy. The key tasks relative to creating the instructional materials and activities include writing the Learning Design Worksheets, Participant Guide, PowerPoint slides, Pre- and Post-tests, and Instructor's Guide.

> **Scripting-Storyboarding**

This task is key in the design phase of the ADDIE Model, as it involves the sequencing, synthesizing, and writing of the training's educational content that is provided by the subject matter expert. In a document referred to as the "Storyboard", the Instructional Designer provides a framework of the course which contains the specific details about its visuals, animations, audio sequencing and all the other details relative to the course's design.

DEVELOPMENT PHASE

> **Graphic Production**

In the development phase of the ADDIE Model, key tasks involve the production of the course material including:

> **Video Production**

These tasks refer to the production of professional videos based on the course content outlined in the Storyboard. Depending on the type of video required for the training, video production can imply the video shooting, video editing and post-production.

> **Audio Production**

These tasks involve the creation of audio media such as voice-over and narration that support the visuals, or the video elements of the course. Voice-overs can be narrative based and prerecorded by the Instructional Designer or can be produced by professional voice-over actors that are hired per contract.

> **Authoring/Programming**

Instructional Designers use authoring tools and eLearning software programs to perform tasks involving the creation of digital learning content. These tools allow the Instructional Designers to manipulate, personalize and animate media objects, adding interactivity to the course. The key tasks involved in authoring/programming are adding interactions in learning scenarios, animating objects, images, or audio, adding navigation options and other edits depending on the course's complexity.

> **Quality Assurance Testing**

Key tasks related to Quality Assurance (QA) testing involve having an individual review the course to identify any possible errors, such as spelling mistakes, typos or other small errors that might have been missed during the development of the course. This also involves identifying if all the functions of the courses (media, audio, layout platform, etc.) are ready for the launch of the course.

> **Project Management**

The tasks related to Project Management involve the management supervision of every stage of the project, from Analysis to Evaluation (ADDIE Model). Tasks involve coordinating and organizing meetings between internal and external parties (Instructional Designer, Subject Matter Experts and other stakeholders involved in the conception of the project). The Project Manager (PM) is responsible for assigning responsibilities and to ensure that the deliverables are produced within schedule. In addition to this, the PM ensures the quality of the learning solution and makes sure it meets or exceeds client expectations.

EVALUATION PHASE

> **SME/Stakeholder Reviews**

The key tasks of the Subject Matter Expert (SME) and the main stakeholders involve producing an in-depth review of the course, in which feedback, areas of improvement and confirmation that the content is relevant for the target learner is provided.

> **Pilot Testing**

These key tasks are part of the evaluation phase of the ADDIE Model. They involve internal and external evaluations, through usability testing and quality insurance processes that are performed by Quality Assurance Managers and the individuals responsible for quality control. These activities aim to provide constructive feedback on the course to ensure it meets usability standards and achieves its pre-established learning goals.

> **Other**

Each eLearning training has unique aspects which affect its cost and its cost estimation. Providing a budget that includes a "cost buffer" gives leeway if unpredictable or unforeseen events occur during any of the stages of the training's development.

3.2 Course Delivery Modalities

Several learning formats and delivery methods are available and offer different possibilities when it comes to creating a training program. Currently, the BTSD has selected eLearning and will use Moodle to design, develop and deliver eLearning training. The most common modalities of delivery are "Instructor-Led Training", "eLearning" or the "Blended" learning modalities. Below is a summary of each modality:

› **eLearning**

  eLearning is commonly referred to as online learning. The participant or learner takes part in the learning sessions by following learning modules or learning materials that are provided strictly online. Most eLearning training is self-paced, meaning the learner can follow the educational content at his own speed and on his own time. eLearning trainings vary in complexity, ranging from simple low range complexity (PowerPoint to eLearning or basic pages with assessment) to higher ranges of complexity including highly interactive media content.

› **Instructor-Led (in person) training**

  Instructor-led Training (ILT) refers to training sessions that are delivered by an instructor to a group of learners in person or face-to face. The most important aspect of ILT is that it is led by an instructor that provides real-time feedback and enables discussions between the learner and the instructor.

› **Blended Learning**

  Blended learning refers to a delivery method that combines ILT workshops, training sessions, lectures) and traditional eLearning (self-paced online learning material).

3.3 Instructor-Led Cost Estimation Model

To optimize the learning of the BTSD personnel, a "Blended" learning solution is the approach recommended by C2D Services. Literature in the field of eLearning and instructional design suggests that blended learning is the most appropriate or beneficial delivery method when designing a more complex organizational training program that involves a large group of people. Since C2D will help facilitate sensitizing workshops to the BTSD (as per WBS 351–352), real-time interaction and feedback by an instructor is necessary to help the learners assimilate new knowledge. Blended learning combines self-paced learning and active learning activities that a strictly eLearning solution does not permit, which ultimately increases the likelihood of reaching the training's learning goals. On the next page, the Chapman Alliance Model provides an assessment of the development costs for ILT

Table 2 | Chapman Alliance Cost Estimation Model for Instructor-Led Training

Development of Instructor-Led Training (ILT)
Combining Average Time and Average Cost to Estimate Development Costs

Tasks	% of time spent on each task	Time spent on each task (per finished hour)	1-hour ILT Course	5-hour ILT Course	10 hour ILT Course
Front End Analysis	12%	5.36	$ 739	$ 3,695	$ 7,391
Instructional Design	16%	6.84	$ 944	$ 4,722	$ 9,444
Lesson Plan Development	12%	5.06	$ 698	$ 3,492	$ 6,985
Creation of Handouts	8%	3.38	$ 466	$ 2,331	$ 4,662
Student Guide/ Workbook Development	11%	4.83	$ 667	$ 3,336	$ 6,671
PowerPoint and/or other visual development	16%	6.76	$ 933	$ 4,667	$ 9,335
Test and Exam creation	8%	3.42	$ 472	$ 2,360	$ 4,720
Project Management during Development	7%	2.88	$ 397	$ 1,987	$ 3,973
SME/ Stakeholder Reviews	8%	3.45	$ 477	$ 2,384	$ 4,768
Other	2%	1.01	$ 139	$ 697	$ 1,395
Totals	100%	43 *	$ 5,934 **	$ 29,672	$ 59,345

Variables:
* Average time of development per finished hour of ILT: 43
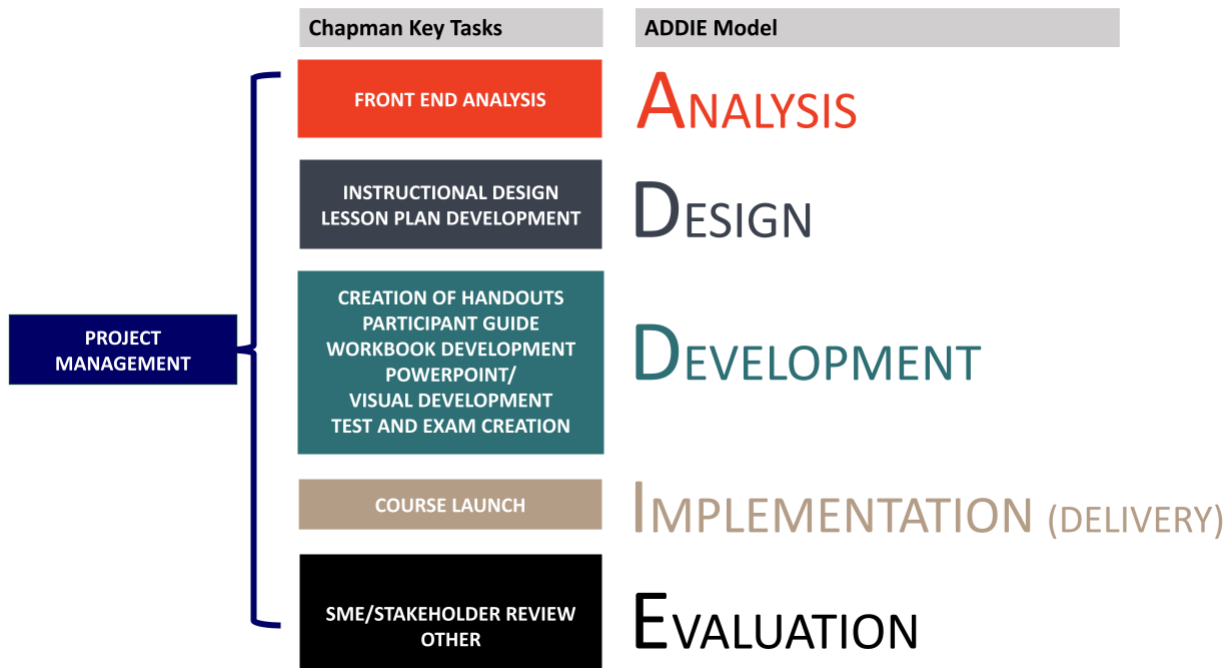** Average cost of development for 1 finished hour of ILT content: $5,934

NOTE: The numbers above assume that all tasks are repeated for each hour of instruction. The study did not explore the efficiency and reduction of time for longer courses by task.

Research data collected: September 2010, by Chapman Alliance

Note: This ILT Cost Estimation Model only includes the cost of designing and developing training. Therefore, the BTSD should also consider the cost of paying instructors, copying course materials, refreshments, etc. and potentially renting classroom space to deliver training for all ILTs.

As described in the Chapman Model, included above, the average time of development per finished hour of an ILT is 43 hours. Depending on the quality of the course, the time of development may vary. To provide an accurate cost estimate, it is important for the BTSD to track the amount of time spent on each developed task. Along with this consideration, it should be noted that the model presented above includes cost in US dollars. Therefore, the cost for one hour of ILT would be $11,868 Belize dollars. ***The BTSD should note that eLearning is three times more costly than ILT***. *As a result, the BTSD should consider eLearning for static courses that will train the most participants over time.*

Figure 4 | Chapman Alliance Cost Model for ILT vs. ADDIE Model

As with eLearning, tasks related to Project Management occur throughout all the stages of development (Analysis to Evaluation). A definition of key tasks per the Development Phase of the ADDIE Model for ILT is presented below:

ANALYSIS PHASE

In the "Analysis" phase of the ADDIE Model, the key tasks involve the following:

> **Front-end Analysis**

Front-End Analysis refers to the tasks performed to conduct an in-depth analysis of the learners and their training needs. This phase includes using methods, processes, and tools to determine the gaps between the current performance (knowledge, skills, or attitudes or behaviors) and desired performance (knowledge, skills, or attitudes or behaviors) that are to be achieved as a result of the training course. These processes and methods are commonly referred to as Training Needs Analysis (TNA) or other types of assessment analysis reports.

DESIGN PHASE

In the "Design" phase, key tasks involve the following:

> **Instructional Design**

The key tasks relative to the Design phase involve activities related to the development and delivery of training learning materials through the choice of appropriate instructional methods and the establishment of specific learning objectives by the Instructional designer (ID). Key tasks relative to creating the instructional materials and activities include writing the Learning Design Worksheets, Participant Guide, PowerPoint slides, Pre- and Post-tests, and Instructor's Guide.

> **Lesson Plan Development**

These tasks are key to the course's development, since they address the planning, organizing, and sequencing of the courses content and material. This includes writing and outlining the learning objectives, learning activities, and learning assessments following instructional methods and approaches that consider and engage various learning styles.

DEVELOPMENT PHASE

> **Handouts Creation**

The key tasks related to the creation of handouts involve creating documents that provide essential information about the course for the participants.

> **Participant Guide/Workbook Development**

The key tasks of developing Participant Guides or Workbooks involve the writing, editing, and sequencing of the Workbooks used by the participants to help them achieve the chosen learning objectives. This involves laying out the learning material in a way that is both engaging to the learner and in alignment with the learner's learning style through a comprehensive document. This also involves formatting the Participant Guide/Workbook in a way that connects and maps out main ideas and key information so that it is clear for the learner.

> **PowerPoint and or/other Visual Development**

The key tasks are developing PowerPoint and/or other visual content to show the course material visually, through a PowerPoint presentation or other visual media such as an infographic, for example. This involves creating a PowerPoint presentation that considers graphic design principles to avoid cognitive overload.

> **Project Management During Development**

The tasks related to Project Management (PM) are the supervision of every stage of development of the Project, from Analysis to Evaluation (ADDIE Model). Tasks include coordinating and organizing meetings between internal and external parties (Instructional Designer, Subject Matter Experts and other stakeholders involved in the conception of the Project.) The PM is responsible for assigning responsibilities and ensuring that the deliverables are produced within schedule. In addition to this, the PM ensures quality of the learning solution and makes sure it meets or exceeds client expectations.

> **SME/Stakeholder reviews**

Key tasks of the Subject Matter Experts (SME) and the main stakeholders involve producing an in-depth review of the course, in which feedback, areas of improvement and confirmation that the content is relevant for the target learner is provided.
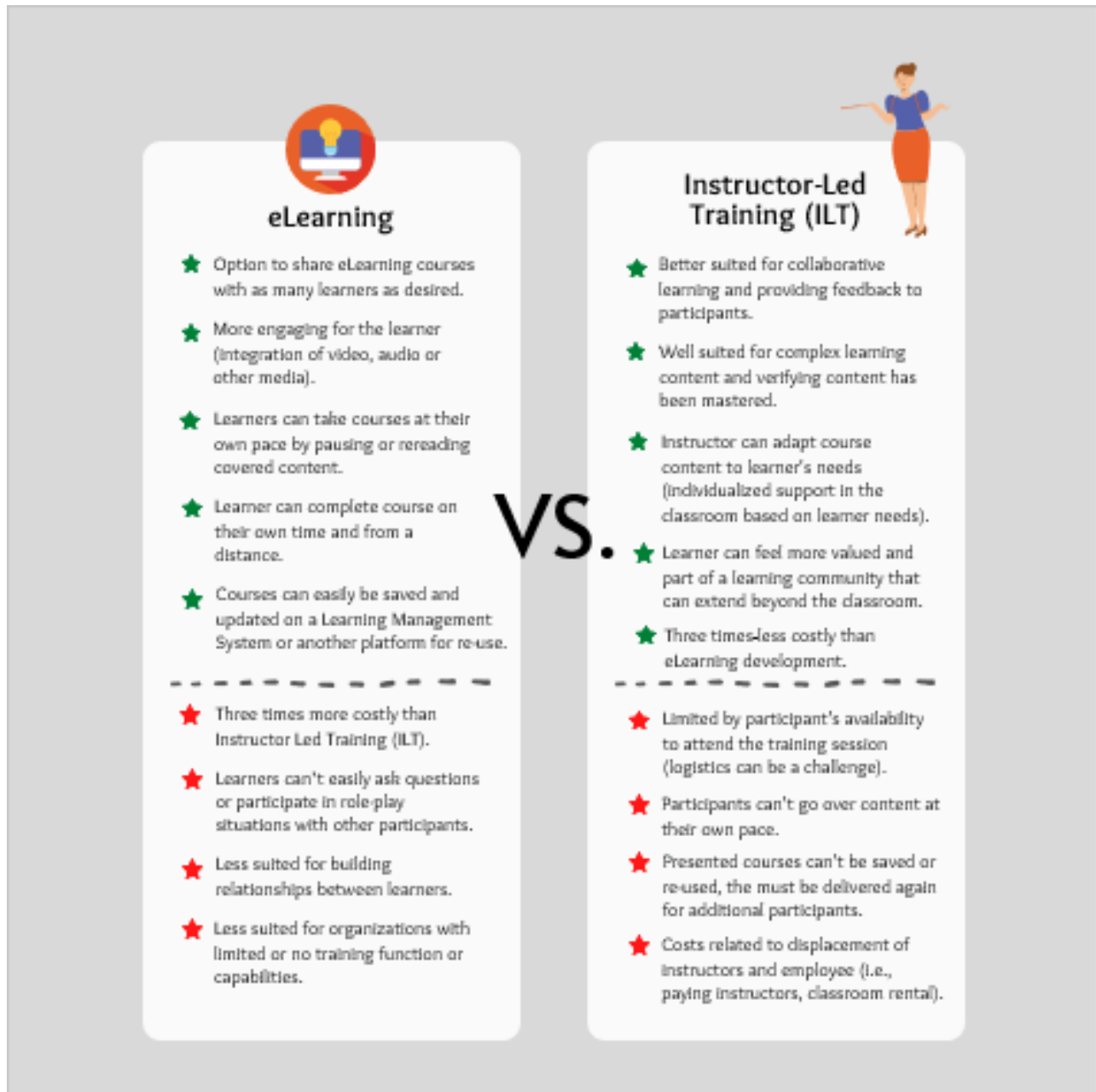
> **Other**

Each ILT training has unique aspects which affect its cost and its cost estimation. Providing a budget that provides a "cost buffer" gives leeway, if unpredictable or unforeseen events occur during any of the stages of the training's development.

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ᴇLEARNING VS. INSTRUCTOR-LED TRAINING

eLearning and ILT have different advantages and disadvantages that should be considered before deciding which approach is best suited for the targeted learners, their specific needs and those of the organization training them. The figure below points out some of the pros and cons of eLearning in comparison to ILT:

Figure 5 | Pros and Cons of eLearning vs. Instructor-Led Training (ILT)

BLENDED LEARNING

A Blended Learning approach provides the advantages of both ILT and eLearning approaches as it suitable for large groups and individuals that are less comfortable with technology. Blended learning allows for engaging courses that can be supported by instructor feedback and anchor the learner's retention of new knowledge.

3.4 BTSD Cost Estimation Model Spreadsheets

C2D has provided the BTSD with two recommendations for Cost Estimation Models to determine costs for the BTSD's Training Plan. The BTSD Cost Estimation Model Spreadsheets will be provided to the BTSD after reaching agreement on the recommended eLearning and ILT Cost Estimation Models.

4 Next Steps

In this section, the recommended next steps must be completed for C2D to be able to provide Cost Estimation Model Tools that will aid the BTSD in the preparation of the BTSD Training Budget:

4.1 BTSD Tasks

The following are the recommended next steps for the BTSD after the submission of the BTSD Training Plan:

> Determine the modality of each course listed in the BTSD Training Plan (eLearning, ILT or Blended).

> Determine potential training providers for each course: Vendor, Donor or BTSD to build—ILT or eLearning.

> Assign BTSD personnel and backup who will be responsible for the BTSD Cost Estimation Models to prepare the BTSD Annual Training Budget.

> After BTSD Training Plan is approved, conduct E-meetings with the BTSD personnel and their backup assigned to practice using the BTSD Cost Estimation Models, to build a budget for one eLearning or ILT course.

4.2 C2D Tasks

Below are the recommended next steps for C2D:

> Support the BTSD in determining the modality of each course: eLearning, ILT or Blended.

> Support the BTSD in determining the potential training providers for each course: Vendor, Donor or BTSD to build—ILT or eLearning.

> Prepare and deliver a training session on how to determine the cost of one eLearning or ILT course.

In conclusion, C2D is looking forward to discussing this report along with seeking approval for the two Cost Estimation Models (eLearning and ILT). In the interim, C2D will move forward with the remaining activities of Phase 200/Assessment of the consultancy.

5   Appendix

The remaining two eLearning Cost Estimation Models (Level 1 and Level 3) are presented below.

5.1 Chapman Alliance Cost Estimation Model (Level 1 eLearning)

ChapmanAlliance
PASSIONATE ABOUT INNOVATIVE LEARNING

Development of Level 1 eLearning
Combining Average Time and Average Cost to Estimate Development Costs

Tasks	% of time spent on each task	Time spent on each task (per finished hour)	1-hour Level 1 eLearning	5-hours Level 1 eLearning	10-hours Level 1 eLearning
Front End Analysis	10%	7.87	$ 1,002	$ 5,009	$ 10,018
Instructional Design	14%	10.88	$ 1,384	$ 6,922	$ 13,845
Storyboarding	11%	9.03	$ 1,149	$ 5,745	$ 11,490
Graphic Production	11%	8.66	$ 1,102	$ 5,512	$ 11,023
Video Production	4%	3.49	$ 445	$ 2,224	$ 4,447
Audio Production	7%	5.47	$ 696	$ 3,478	$ 6,956
Authoring/ Programming	17%	13.42	$ 1,708	$ 8,541	$ 17,082
QA Testing	6%	5.12	$ 651	$ 3,257	$ 6,515
Project Management	6%	5.08	$ 646	$ 3,232	$ 6,463
SME/ Stakeholder Reviews	7%	5.59	$ 711	$ 3,557	$ 7,115
Pilot Test	4%	3.43	$ 437	$ 2,185	$ 4,370
Other	1%	0.96	$ 122	$ 608	$ 1,216
Totals	100%	79	$ 10,054	$ 50,270	$ 100,540

Variables:
*   Average time of development per finished hour of Level 1 eLearning: **79**
** Average cost of development for 1 finished hour of Level 1 eLearning: **$10,054**

NOTE: The numbers above assume that all tasks are repeated for each hour of instruction. The study did not explore the efficiency and reduction of time for longer courses by task.

Research data collected: September 2010, by Chapman Alliance

5.2 Chapman Alliance Cost Estimation Model (Level 3 eLearning)

ChapmanAlliance
PASSIONATE ABOUT INNOVATIVE LEARNING
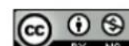
Development of Level 3 eLearning
Combining Average Time and Average Cost to Estimate Development Costs

Tasks	% of time spent on each task	Time spent on each task (per finished hour)	1-hour Level 3 eLearning	5-hours Level 3 eLearning	10-hours Level 3 eLearning
Front End Analysis	9%	42.97	$ 4,417	$ 22,086	$ 44,171
Instructional Design	13%	61.97	$ 6,370	$ 31,850	$ 63,700
Storyboarding	11%	53.22	$ 5,471	$ 27,355	$ 54,711
Graphic Production	13%	64.53	$ 6,633	$ 33,167	$ 66,335
Video Production	6%	30.46	$ 3,131	$ 15,654	$ 31,308
Audio Production	5%	26.61	$ 2,736	$ 13,678	$ 27,355
Authoring/ Programming	18%	86.39	$ 8,881	$ 44,404	$ 88,808
QA Testing	6%	31.51	$ 3,239	$ 16,196	$ 32,392
Project Management	7%	32.19	$ 3,309	$ 16,545	$ 33,090
SME/ Stakeholder Reviews	6%	30.61	$ 3,146	$ 15,731	$ 31,463
Pilot Test	4%	20.96	$ 2,154	$ 10,772	$ 21,543
Other	2%	8.59	$ 883	$ 4,417	$ 8,834
Totals	**100%**	490	$ 50,371	$ 251,855	$ 503,710

Variables:
* Average time of development per finished hour of Level 3 eLearning: **490**
** Average cost of development for 1 finished hour of Level 3 eLearning: **$50,371**

NOTE: The numbers above assume that all tasks are repeated for each hour of instruction. The study did not explore the efficiency and reduction of time for longer courses by task.

Research data collected: September 2010, by Chapman Alliance