



Foundations of Instructional Design

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Introduction

Welcome to Foundations of Instructional Design. This eBook was created to support a Foundations in Instructional Design and Learning Technology course. It is designed to introduce you not only the the nuts and bolts of the instructional design process, but to also introduce you to other elements that factor into the design, and both inform your designs and help to make them a reality.

This book supports the creation of an instructional design document (IDD). The primary purpose of an instructional design document is to help you build out and create effective courses. A good instructional design document contains enough information that an knowledgeable other (e.g. someone with similar knowledge of the topic and instructional design skills) can build the course.

PART I

GETTING STARTED

The first part of this book includes things that you need to get started with online learning and with instructional design.

1. Introduction to Online Learning

For many of you, learning online is a new experience. In this section I've provided some tips and resources to help you get started with online learning.

As adult learners, **you get out what you put in** – that is, if you only do the minimum needed to get credit in an online course, then you will get the minimum out of the course. If you use online learning as an opportunity to expand your knowledge and you take every opportunity you can to learn, you will get more out of the course.

Recognize also that not everyone in the course has the same goal. Some of your colleagues will go above and beyond the course requirements while others will do only what is required. Please be patient with one another and appreciate that we all have different situations that impact our abilities to be engaged adult learners.

Netiquette

Netiquette is a term used to describe appropriate behaviours when working on the Internet. It is an old concept, but one that everyone should be reminded of on a regular basis.

Albion provides a good summary of the [Core Rules of Netiquette](#).

Tips for Online Learning

For many of you, online learning is a new experience. Many of the best practices for online learning are the same as for face-to-face learning. The bigger issue is that you won't have a face-to-face class to ensure you are keeping pace with the course.

Time management is always the number issue for students. One thing that I find with online courses is that students forget to account for the extra 3 hours they would have spent in the classroom – so they look at online as only the 'homework' component of the course and not the interactive part of the course. I recommend that you plan to check-in to your courses at least 3 times during the week. I know most students do the majority of their work on weekends, however, the courses in this program are designed to include interactivity throughout the week.

If you know you are going to be away one week, or traveling for part of a week, try to get ahead before you leave. Also if it coincides with teamwork, ensure that you tell your teammates.

Dedicated study space: Find a space that helps your focus on your studies. Everybody is different. Some students like the white noise of a coffee shop where other prefer the silence of the library.

Reduce distractions: This is an online course so there will always be distractions on your computer – Facebook, email, text messages can all distract from studying. I'm on a Mac, and one thing I do is to turn off notifications when I want to study, and I use a different workspace window. So I don't get any pop ups that break my concentration.

Ask questions: Do not allow yourself to get frustrated. One strategy I employ is to set a time limit for how long I will try to figure something out. If I cannot, then I either ask a question or walk away and work on something else for a bit. Usually, that time away gives me a new perspective to that helps me solve

the problem. If you are stuck, don't be afraid to ask questions – your classmates are also likely stuck.

Learn the technology: Allocate some dedicated time to learning how to use the tools you need to be efficient in your classes. Spending a little time early on learning how to use Microsoft Word styles, for example, will save you a lot of time down the road. Most weeks, I'll be introducing new technologies and providing links to tutorials. Use that time to figure out which technologies work well for you.

Beat deadlines: Try to get assignments done early. Inevitably something will come up at the last minute that will make it difficult for you to get your assignment completed. If you start early, you will be under less pressure later. Now, if something does come up and you just cannot finish online, let me know as soon as you realize you are going to have a problem.

Identify your learning goals: Not everyone is here for the same reason, but you all did decide to take this course. You are here for a reason. It might be helpful to write this down somewhere to remind yourself of it whenever you go through a difficult patch in the course.

Consider the [Pomodoro technique](#): I will put a referenced to this as a link to this slide and in the post comments. Pomodoro is based on the idea that you can focus for short stints of time – although this is slightly different for everyone. Personally I use 30 minutes. I have an app called TimeOut that tells me when 30 minutes is up and actually kicks me off my computer for 5 minutes. This helps my body from getting stiff, but it also helps me refocus my mind, so that I can get things done. Often when I'm procrastinating, I can convince myself to just do one Pomo – which then gets me kick started and next thing I know, I'm working for hours (with a 5 minute break every 30 minutes).

Figure out what works for you: Since this is your first class, and some of you may have been out of school for a while, and likely when you were in school you were at a different place in your life. Take the first few weeks to really pay attention to what

works well for you and what doesn't. You can then integrate this into your schedule. For example, I'm a morning writer. I get my best focused work done first thing in the morning. I started setting an alarm and getting up earlier because it meant more productive hours for me. Once it hits dinner time I'm done for the day. My brain is shot by then, so I generally leave that time to browsing / reading / and answering the occasional question. Each one of us is different, figure out what works for you.

The Pomodoro Technique

Below is a great video that introduces the Pomodoro Technique. I find that even when I'm busy or stressed, I can find 20-25 minutes to sit down and focus, and by doing this, it reduces my stress and makes me more productive.



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Other Resources

Since Covid, the number of resources available to help learn how to learn online has increased dramatically. I've curated a few of the ones I think might be useful:

- [Online Student Readiness Tutorials](#) by the California Community Colleges Online Education Initiative. These are great tutorials to help you prepare to learn online. Tip: You can go through them faster by reading the text rather than watching the multimedia presentation. They also have an audio MP3 version of the tutorials so you can listen while setting up your home learning space!
- [Online Student's Manual for Success: How to study smarter, find a tutor, and excel in the digital classroom](#) by Claudio and Strempek via Learn How to Become
- [21 Study Tips for Online Classes Success](#) by Good Colleges Writing Team
- [Tips for Successful Online Learning](#) by Joyce via EdX Blog

2. Introduction to Instructional Design

This chapter contains a brief overview of what instructional designers do. At this point in time, you may be unfamiliar with some of the terminology used. Take a moment to write down any terms you do not understand. As you work through the process of learning instructional design, you can check off the unfamiliar terms as you learn more about them.

ADDIE



One term you will hear a lot within instructional design is ADDIE, which stands for Analysis, Design, Develop, Implement, Evaluate. This book is structured around ADDIE. Although ADDIE is talked about as a linear process, in many instructional design methods it is not linear, rather the design involves cycles, with each with each instructional design model adapting ADDIE to its specific context.



ADDIE is often referred to as an instructional design model, but it isn't specifically a model, rather it is a generic term that is used when referring to traditional **instructional systems design (ISD)**. From my experience, I find that all instructional design models contain each of the five elements. The models just describe the different ways in which these elements apply.

I've created two infographics for your reference. The first is of the different activities that occur in the various ADDIE phases, and the second is a list of typical tools used in each phase (click image for larger version).

Instructional design models

Instructional design models describe different approaches to designing and developing instruction. There are many different models, and most of what is done in practice is a hybrid of several models, depending on the needs of the organization.

Here is a list of different models you can explore. Notice how they each contain the ADDIE components.

- [AGILE instructional design](#)
- [Backward design – Understanding by Design](#)
- [Action Mapping](#)
- [SAM model](#)

- [ASSURE model](#)
- [Kemp instructional design model](#)
- [ABC Learning Design](#)

What does an instructional designer do?

Stefanie Erika does an excellent job of describing the basics of what an instructional designer does in the following YouTube video:



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view it online here: <https://id.rjhogue.name/foundations/?p=24>

Explore – What do instructional designers do?

This explore interactive allows you to work through the exploration and take your own notes. Once you get to the last page of this interactive you will be able to export your answers into a Microsoft Word document.

Your responses will be lost when you refresh your browser window. I recommend that you download your word file before moving onto another task.



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<https://id.rjhogue.name/foundations/?p=24>

Resources

If you have access to LinkedIn Learning there is an excellent course called [Instructional Design Essentials: Models](#) of ID by Joe Pulichino.

PART II

ANALYZE

The A in ADDIE stands for Analyze. In this section we will look at the various ways in which Instructional Designers analyze training requirements.

Tasks

Analyze



- Needs assessment
- Define instructional goals
- Describe context
- Describe learners
- Analyze instructional goals
- Task analysis

Common Tools

- Survey software (Google forms, SurveyMonkey)
- Drawing (PowerPoint, Draw.io)
- Curation tools (Google sites, Wakelet)

3. Needs Analysis: What problem are you trying to solve?

“The logic of needs assessment can be summarized as a simple equation:

Desired status – Actual status = Need

Needs assessment is sometimes called discrepancy analysis. The discrepancy is the observed difference between the desired status and the actual status.” ([Dick, Carey, & Carey](#), 2014, p.23).

Tim Slade does a great job of explaining what a Training Needs Analysis is and why we need it in the following YouTube Video. Note the term KPI stands for [Key Performance Indicator](#).



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When training isn't the right solution

Oftentimes, and I've experienced this many times, a boss or supervisor will come to you exasperated at some situation and the words “*we need training for this*” will come out of their mouths. Training might be required, but it might not. There

are ways of fixing, or ameliorating, issues with performance without going the training route, so we first need to figure out if a learning intervention is what is actually needed. Training is often an expensive solution to the problem, so you don't want to create training that you don't need.

Here are some examples of times when training might not be the right solution to the problem, and alternative solutions that might be more appropriate.

Fix the problem

Many times you'll be asked to create training for something that isn't a training problem. For example, if a user interface on a computer application isn't well designed – you might be asked to create training to teach people how to use the application. Often, changes to the user interface can be made to avoid the need for training. Fixing the problem in the product design is a more effective solution than training around the problem.

Redesign the process

Sometimes you are asked to create training to teach people how to perform complex tasks or workflows. Sometimes these complex tasks or workflows can be redesigned to be less complicated. When this is possible it is a better solution to the problem.

Write documentation

Training is a lot more expensive to produce than good user documentation. Also, people often would prefer to look up what they need to know when they need to know it. If there is no good documentation, you'll need to ask if documentation

alone would solve the problem. You may find that you need to create documentation in order to create the training anyways.

Good documentation can be a real asset when designing training.

Create a job aid

A job aid is something that can be used directly on the job that replaces the need for specific training. An example of a job aid is a handwashing poster that is placed right over the sink. The poster is more efficient and effective at getting people to wash their hands properly than a course in handwashing.

4. Performance Environment

“For higher-order learning, a careful context analysis is critical for aiding the designer in recreating authentic elements of the performance context during instruction and enabling the learner to build optimal conceptual frameworks for learning and remembering.” (Dick, Carey, & Carey, 2014, p. 99)

Context matters. There are two specific contexts that affect your instructional design decisions. First is the *performance environment*. This is where the skill or knowledge will be used in the ‘real-world’. The second is the *training environment*. This is where the instructional will take place. At this time, we are going to focus on the Performance Context Analysis.

The performance environment describes where the skills are knowledge are applied outside of the training context. In some cases, these can be the same or vary similar. For example, you teach swimming in water (a pool or a lake). Regardless of where the swimming actually occurs, the environments are similar but they are not necessarily the same. You may teach swimming in a pool but the learner may actually swim in open water.

Ideally, you want your training environment to be as close as possible to your performance environment.

Some reasons why it may not be possible to have performance environment and training environment the same:

- **Safety.** When teaching dangerous skills, it isn't necessarily safe for the learner (e.g. astronauts) or others (e.g. unsafe for patients for surgeons to practice skills).
- **Cost.** When there is a risk of equipment being damaged or a limited amount of equipment available, it may make more sense to do training in a simulated environment.
- **Distraction.** When the training requires undistracted attention and the performance context is full of distractions.

Performance Environment

Things to example when looking at the performance environment:

- Needs of the organization.
- Physical aspects (e.g. is it quiet, is it noisy, are workspaces private/public)?
- Social aspects (e.g. does workers work alone or as a team)?
- Available tools (e.g. do the workers need/use specific tools in their work)?
- Processes (e.g. do the workers follow specific processes to achieve the task at hand)?
- Constraints (e.g. are there unchangeable aspects of the environment that need to be considered?)
- Other – anything else you can think of that might affect the design of instruction.

One of the most effective ways to gather performance environment information is to observe employees in their work.

There you can see for yourself what tools are available to employees as well as the physical and social aspects of their workplaces.

When documenting the performance environment, you want to write down anything that you think might help you design a more authentic learning experience.

5. What is your goal?

One expression you often hear in Instructional Design is “begin with the end in mind”. The idea here is, that we need to figure out first what we want to achieve with instruction before we can design a good learning experience. But where do instructional goals come from? and how do we best express them? That is what we are going to look at in this chapter.

No matter what we do in instructional design, we start with defining what our goal is. What is it we are trying to achieve? Identifying and clearly articulating the goal for needs analysis, for instruction or for program evaluation will help you design something that meets the needs. **If you don't clearly articulate your goal, you will not know when you have achieved it.**

Identifying Instructional Goals

After completing a needs analysis, and identifying the instruction is the right solution to the problem, it is time to identify and write your instructional goal.



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Writing Instructional Goals

Instructional goals should be clear, concise, and observable.

Instructional goals are written from the perspective of the [performance environment](#).

A typical confusion is between instructional goals and learning objectives. Instructional goals are written from the perspective of the performance environment, where learning objectives are written for the classroom environment.

What is meant by observable?

This requirement stems from behaviourist learning theory, where learning was considered something that you can measure. If you can observe it and measure it, it is observable. Often, beginner instructional designers use terms like ***understand*** and ***appreciate***; however, you can not observe understanding or appreciation.

In addition, the terms understand and appreciate are not precise. They don't help the instructional designer figure out how to create a learning plan. It is ok to start with the word understand, but then you need to ask *what does it mean to understand/appreciate? How will know that the learner understands/appreciates?* The answers to these questions are often something you can use as an instructional goal.

Using Bloom's Taxonomy

Bloom's Taxonomy is a list of observable verbs that are organized in a hierarchical manner. There are many different Bloom's verbs lists, such that you can easily Google "Bloom's

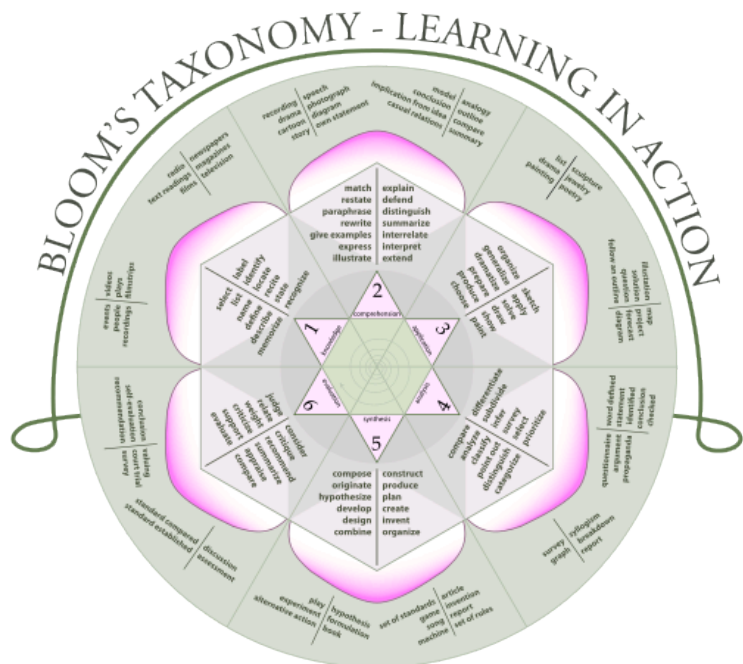
verbs" when you are looking for a verb to write an instructional goal or learning objective using language that is observable.

I like newer versions of the Bloom's taxonomy with "create" at the top. You will find this taxonomy particularly useful later in the course when you are creating learning objectives. For now, the taxonomy is useful in finding verbs to describe what you want learners to do in the performance context.

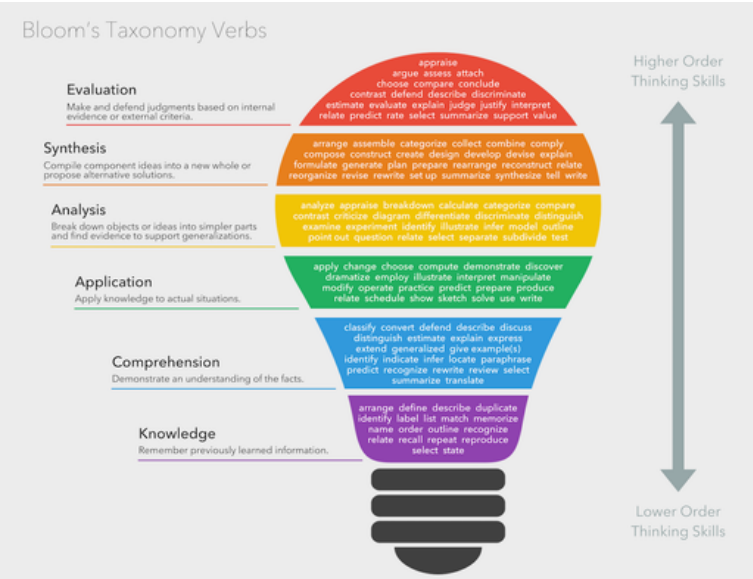
Generally in writing instructional goals we are looking at the higher level of blooms. Look for verbs in the applying, analyzing, evaluating, and creating areas. Avoid remembering and understanding as those are typically verbs used in the learning context not the performance context.

, _____ via _____ Wikimedia _____ Commons"
href="https://commons.wikimedia.org/wiki/
File:Blooms_rose.svg" _____ data-
url="https://commons.wikimedia.org/wiki/

File:Blooms_rose.svg">



via [Wikimedia Commons](https://commons.wikimedia.org/wiki/File:Bloom%E2%80%99s_Taxonomy_Verbs.png)
href="https://commons.wikimedia.org/wiki/
File:Bloom%E2%80%99s_Taxonomy_Verbs.png" data-
url="https://commons.wikimedia.org/wiki/



A recipe for writing instructional goals



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view it online here: <https://id.rjhogue.name/foundations/?p=29>

“A complete goal statement should describe the following:

- The learners
- What learners will be able to do in the performance context

- The performance context in which the skills will be applied
- The tools that will be available to the learners in the performance context” (Dick, Carey, & Carey, 2014, p.27)

Tip: Use the phrase **“need to be able to”** when writing out your instructional goal. This helps avoid writing learning objectives.

For example:

Instructional designers

Need to be able to write observable instructional goals

At their home office

With pencil and paper

Validating Your Instructional Goal

“Any selection of instructional goals must be done in terms of the following three concerns:

1. Will the development of this instruction solve the problem that led to the need for it?
2. Are these goals acceptable to those who must approve this instructional development effort?
3. Are there sufficient resources to complete the development of instruction for this goal?” (Dick, Carey, & Carey, 2014, p.27)

The three questions above help to validate that your instructional goals make sense. You can follow the recipe and write a perfectly formatted instructional goal, but if it doesn’t solve the problem, won’t get approval, or is too expensive to implement, the goal is not useful. These are questions that only make sense if you understand the performance environment.

They are questions you should consider when doing a [training needs analysis](#).

6. Analyzing Your Goal

Once you have articulated your instructional goal, the next step in the process is to break down that goal into the steps required to complete the goal.

The question you are trying to answer when completing a goal analysis is:

What do experts do to accomplish the goal successfully?

In addition we want to focus on expressing our analysis using language that is observable. This focus on observable will become really important when we start talking about assessment and how we validate that learners have achieved the instructional goal.

Avoid trying to articulate what the expert is thinking, rather, focus on what the expert is doing.

Performance Not Learning

At this point in the process, we are still focusing on the performance context, not the learning context. Later, we will look at what we want to teach. For now, we want to stay focused on what the successful person does.

Not Necessarily Linear

Goal analysis is often shown as a linear process, goals do not necessarily need to break down into an ordered linear fashion. We use the linear model as a way to abstract the goal and

break it into component parts, but it doesn't necessarily show the order in which those parts need to take place.

Examples



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Example: Writing observable goals

Goal: Instructional Designers need to write observable instructional goals in their home office with pencil and paper

Goal Analysis:

1. Gather pencil and paper.
2. Write the learners title.
3. Write what the learners need to be able to do in the performance environment.
4. Write a description of the performance environment.
5. Write a list of tools available within the performance environment.

Example: Evaluating new technologies

Goal: Instructional designers need to be able to effectively evaluate new technologies using a minimal amount of time.

Goal Analysis:

1. Set a time limit for the evaluation
2. Write out evaluation criteria.
3. Search for several tools that meet the criteria.
4. Choose one tool and evaluate against criteria.
5. Create a journal entry outlining findings.
6. Repeat steps 4 and 5 with other tools.
7. Stop when time ends.

Example: Making a peanut butter and jelly sandwich

Goal: Beginning college students need to know how to make a peanut butter and jelly sandwich with bread, peanut butter, and jam.

Goal Analysis:

1. Take two slices of bread out of bag put them on the cutting board.
2. Open peanut butter.

3. Take knife spread butter on one slice of bread.
4. Open jam.
5. Take knife and spread on other slice of bread.
6. Put covered sliced of bread together.

7. Learner Characteristics

Another step in the analysis process is to determine the various characteristics of your learners. Understanding your learners will help you make better design decisions.

Considerations for Learner Analysis

Understanding characteristics of our learners helps us make better design decisions. The more we know, the more likely we are to choose instructional strategies that will work for learners.

Wikiversity had a great tutorial on [Learner Analysis](#) including a template to help you do it.

If you are not in a position to actually interview a few students (either future or previous), then you will need to take your best guess at articulating who you think your learners will be. What you are doing by writing it down is articulating the assumptions you are making about your learners when you are making decision about the design.

Creating Personas

Understanding characteristics of our learners helps us make better design decisions. The more we know, the more likely we are to choose instructional strategies that will work for learners.

If you are not in a position to actually interview a few students (either future or previous), then you will need to take your best

guess at articulating who you think your learners will be. What you are doing by writing it down is articulating the assumptions you are making about your learners when you are making decision about the design.

Persona Example: Jackie



Jackie works full time as a trainer for a non-profit organization that has about 500 volunteers. She is responsible for onboarding the volunteers.

After work she rushes home to ensure she has time to spend with her kids before they go to bed.

After the kids are asleep she has time dedicated to complete her graduate studies.

Age: 35

Education: Undergraduate degree in Social Sciences, no formal instructional design training

8. Task analysis (skills and knowledge analysis)

When doing your goal analysis, you broken your goal down into tasks. You answered the question “what does the expert do in order to achieve the goal?”

The next step in the process is to break down each of the tasks asking the questions:

- What does the learner need to know? (knowledge)
- What does the learner need to know how to do? (skills)

Caution: Don't get caught up in the names of the processes – that is, what some people call task analysis others call subordinate skills analysis. Some people call goal analysis, others call it all task analysis. What is important to remember is that we first ask “what does the expert do?” and then we ask “what does the learner need to know or know how to do?”

For each step in the goal analysis, what skills and knowledge are needed for the instructional designer to complete the step successfully? Generally, this is done for most tasks in the goal analysis – however, if the task is general knowledge or skill or prerequisite knowledge or skill it is skipped.

Examples of task analysis

Writing Observable Goals

Goal: Instructional Designers need to write observable instructional goals in their home office with pencil and paper

Goal Analysis:

1. Gather pencil and paper.
2. Write the learners title.
3. Write what the learners need to be able to do in the performance environment.
4. Write a description of the performance environment.
5. Write a list of tools available within the performance environment.

Task Analysis:

1. Gather pencil and paper.
2. Write the learners title.
 1. Know a title that describes the majority of learners
3. Write what the learners need to be able to do in the performance environment.
 1. Write down what they do using measurable terminology
 1. Know where to find a list of measurable verbs.
4. Write a description of the performance environment.
 1. Know what characteristics of the performance environment need to be noted.
5. Write a list of tools available within the performance environment.
 1. Recognize various tools.

2. Know the names of specific tools.

Evaluating New Technologies

Goal: Instructional designers need to be able to effectively evaluate new technologies using a minimal amount of time.

Goal Analysis:

1. Set a time limit for the evaluation
2. Write out evaluation criteria.
3. Search for several tools that meet the criteria.
4. Choose one tool and evaluate against criteria.
5. Create a journal entry outlining findings.
6. Repeat steps 4 and 5 with other tools.
7. Stop when time ends.

Task Analysis:

1. Set a time limit for the evaluation – skip this one as it doesn't require any training beyond a suggestion as the length of time depends on the complexity of the tool being evaluated.
2. Write out evaluation criteria – what does the instructional designer need to know or know how to do in order to write out the evaluation criteria? Remember, you are not actually writing the evaluation criteria, rather you are writing out how the evaluation criteria is set out.
 1. What is the goal / purpose of the evaluation?
 1. How to write a goal statement.
 2. What is the purpose of the tools being evaluated?
 3. What tools are actually being evaluated?
 1. Where do you find a list of tools to determine what to evaluate?

4. What reviews have already been done on the tool?
 1. How do you find current tool reviews?
 1. How to filter search results by date.
5. What tools are similar to the tool being evaluated?
 1. How do you find similar tools?
 2. How do you find tools of a different type that might also be used to do the same job?
6. What perspective is the evaluation being done from?
 1. Who will use the evaluation?
7. Who are the end users of the tool?
8. What are common tasks done with the tool?
9. How will you rate the different tools?
10. How do you know the evaluation is complete?
3. Search for several tools that meet the criteria.
 1. How to write a good search string.
 1. How to use the AND operator
 2. How use the OR operator
 2. How to find alternative terms to broaden search.
 3. How to know you have found the 'right' tools to include in your review.
 4. How many is several?
4. Choose one tool and evaluate against criteria.
 1. How to learn a new tool quickly?
 2. Where to find good tool tutorials?
 1. How to search YouTube.
 2. How to search the tool provider website.
 3. Where to find other sources of training material.
 3. How to tell between advertised hype and actual tool use?
5. Create a journal entry outlining findings.
 1. How to write up findings in a way that they can be used in the future

1. How to write a paragraph identifying the criteria.
2. How to use a table to
2. What not to write
3. How to keep this step from being overwhelming
6. Repeat steps 4 and 5 with other tools – skip – this doesn't need an analysis it is a repeat of prior steps.
7. Stop when time ends – skip – this doesn't need an analysis as it is common knowledge.

Crew Overboard Drill



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view it online here: <https://id.rjhogue.name/foundations/?p=90>

Interviewing Subject Matter Experts (SMEs)

An important skill for instructional designers is knowing how to interview Subject Matter Experts.

Typically, when interviewing the SME the goal analysis and and task analysis happen at once, although this does depend on the size of the project.

I usually begin a SME interview by asking them to explain the step-by-step process. I like to draw this out on a whiteboard as they are explaining it (if feasible) – or I use a Google doc if I'm doing it online.

Once I have the steps, the next question is: what does the learner need to know, that is knowledge, and what does the learner need to know how to do?

A question that comes up often during this process, is how far do you drill down– that is how detailed. I usually try to go down to one level of prerequisite, so once you drill down far enough that you are getting to knowledge or skills that you expect learners to have before they enter the course, then you can stop.

I also ask a lot of clarifying questions. I ask “what does this mean?” and “will learners know that already?”

The question “what mistakes do people new to the activity make helps to identify both the skills and knowledge necessary to complete the task, and often helps to identify priorities in the training.

PART III

DESIGN

The first D in ADDIE stands for Design. In this part of the book we will look at some techniques used by Instructional Designers to design learning experiences.

Tasks

Analyze



- Needs assessment
- Define instructional goals
- Describe context
- Describe learners
- Analyze instructional goals
- Task analysis

Common Tools

- Survey software (Google forms, SurveyMonkey)
- Drawing (PowerPoint, Draw.io)
- Curation tools (Google sites, Wakelet)

9. Writing Learning Objectives

D is for Design. We have now completed the Analysis phase of ADDIE and we are moving into the Design phase.

In the design phase, we use all the information we collected during the analysis phase to start designing the instruction.

The first thing we will do is to use the information we have collected to create learning objectives.

Learning objectives, the topic you've all been waiting for. We now shift a little and our thinking from analyzing the performance context, to looking at the learning context.

There are lots of different names for objectives. And Dick and Carey like to break them out into different kinds of objectives. The process works regardless of what you call the objective. This is perhaps one of the more valuable parts of designing instruction. So it's often the part that many instructors are taught. But as you've already learned through the goal and context analysis so much is left out if you start with learning objectives.

When presented to students, I think of learning objectives as [advanced organizers](#) (this is a term that is used within cognitive learning theory) – Giving students an advanced organizer helps them figure out what's relevant and not relevant when they receive new information.

Goals vs. Objectives

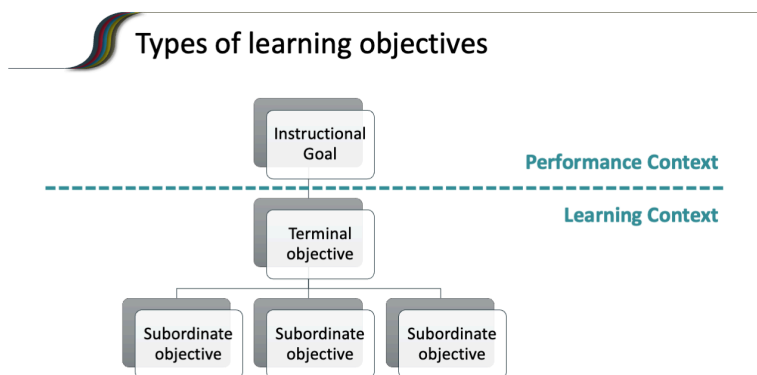
I'm often asked what's the difference between a goal and objective.

The biggest is that the goal is set in the performance context. The question I often ask is what does someone who does this successfully already do? That is the goal. For example, Instructional designers use the Dick and Carey method of instructional systems design to create an instructional design document.

Objectives, on the other hand, are set in the learning context and are typically specific to a single lesson. What do you want your students to do by the end of the lesson? How will you, as the teacher, and your students know they have achieved that goal?

For example,
After completing this lesson, learners will be able to articulate the difference between goals and objectives.

Types of Learning Objectives



Dick and Carey divide learning objectives into the terminal objective and the subordinate objectives. The relationship between the types of objectives and the instruction goal is described as:

“The goal is a statement of what students will be able to do in the performance context ... The goal is rephrased as a terminal objective describing what students will be able to do in the learning context, and subordinate objectives describe the building-block skills that students must master on their way to achieving the terminal objective” (Dick, Carey, & Carey, 2014, p.119).

Further a given objective might be classified as:

- **Performance** objectives – those related to performing a physical skills
- **Learning** objective – those related to verbal information or intellectual knowledge
- **Behavioral** objective – those related to changes in attitude or behavior

The type of objective doesn't matter – the process for creating them is the same.

Where Do You Get Your Learning Objectives?

Your learning objectives should be derived directly from your task analysis. Typically, your goal analysis provides you with high level tasks that can be written as learning objectives. These would be examples of terminal objectives. These objectives typically use the higher levels of [Bloom's taxonomy](#).

Recall in the task analysis, that you looked at what the learner needed to know. These are usually learning objectives, sometimes also called subordinate objectives. These are the objectives that are needed in order to complete the upper level objectives. These often use the lower levels of Bloom's Taxonomy.

Example: Performance Objectives

Instructional Goal: Instructional designers need to be able to effectively evaluate new technologies using a minimal amount of time.

Goal Analysis	Performance objective
1. Set a timeline for the evaluation.	No objective required.
2. Write out evaluation criteria.	Given a tool category and evaluation purpose, learners will be able to write and least five different evaluation criteria.
3. Search for several tools that meet the criteria.	Given a tool category and evaluation purpose, learners will be able to use a search engine such as Google to find at least three tools to evaluate.
4. Choose one tool and evaluate against criteria.	Given evaluation criteria, learners will be able to evaluate at least three tools.
5. Create a journal entry outlining findings.	Given evaluation criteria and access to at least three tools, learners will be able to write a short report outlining their evaluation findings.
6. Repeat steps 4 and 5 with other tools.	No objective required.
7. Stop when time ends.	No objective required.

Example: Subordinate Objectives

Performance Objective:

Given a tool category and evaluation purpose, learners will be able to write and least five different evaluation criteria.

Subordinate Objectives:

1. Learners will be able to write an evaluation goal statement.
2. Learners will be able to identify the purpose of the tools being evaluated.
3. Learners will be able to identify three tools to be evaluated.
4. Learners will be able to find current tool reviews.
5. Learners will be able to filter search results by date.
6. Learners will be able to identify the audience of the evaluation.
7. Learners will be able to discover what common tasks are done with the selected tools.
8. Learners will be able to document evaluation exit criteria.

Writing Learning Objectives

How to Write Learning Objectives

ABCD



AUDIENCE

Who will be doing the behavior?



BEHAVIOR

What should the learner be able to do?



CONDITIONS

Under what conditions do you want the learner to be able to do it?



DEGREE

How well must it be done?



EXAMPLE

Instructional design students will be able to write learning objectives with the aid of this document 100% of the time.

The mnemonic – ABCD – helps remember the different parts to a learning objective.

AUDIENCE – Who will be doing the behavior?

BEHAVIOR – What should the learner be able to do?

CONDITIONS – Under what conditions do you want the learner to be able to do it?

DEGREE – How well must it be done?

For EXAMPLE – Instructional design students will be able to write learning objectives with the aid of this document 100% of the time.

Note that when the degree is 100% of the time, that part of the statement is not required because it is implied that if you do not include a number here, the number is 100%.

Note that learning objectives do not describe how you will teach.

Validating Your Learning Objectives

Are your learning objectives

SMART?

S

SPECIFIC

What do you want learners to do?
Is it observable?

M

MEASURABLE

How will you know it is done
successfully?

A

ACHIEVABLE

Do the learners have the prior
knowledge and skills necessary?

R

RELEVANT

Is the objective relevant to the
course/lesson goal?

T

TIME-BOUND

When will it be done?

A mnemonic that is used to validate learning objectives is SMART.

Are you learning objectives:

S – Specific – What do you want learners to do? Is it observable?

M – Measurable – How will you know it is done successfully?

A – Achievable – Do the learners have the prior knowledge and skills necessary?

R – Relevant – Is the objective relevant to the course or lesson goal?

T – Time-Bound – When will it be done?

10. Creating Assessments

In this chapter, we will be exploring ways to assess student learning. It may seem odd to be doing this before creating learning materials, however, it is common practice. There is an instructional design method, called Backwards Design or [Understanding by Design](#), that has popularized the process of creating assessments right after creating learning objectives.

One of the reasons for creating assessments first, is to ensure the assignments align with the learning objectives. It is not fair to create assessments that are not tied to what students are being expected to learn.

Assessment is all about measuring learning.

There is a lot of terminology associated with assessment, which we will cover first. Then we'll look at some better practices for creating **criterion referenced learner assessments**.

Terminology

Assessment and Evaluation

The terms assessment and evaluation are not used consistently in the field; however, I use them consistently and in a very distinct way.

I use the term **assessment** when I am talking about something that is done for or of students. For example, an assignment in a course is a learner assessment.

I use the term **evaluation** when I'm talking about something that is done for or of programs or courses. For example, at the end of a course you do a course evaluation where you as a student, tell me how I am doing as an instructor as well as providing your input on the overall structure of the course and learning materials. You have likely completed end of course evaluations for almost every course you have taken. These are done to help improve the program, not how to help an individual learner improve.

Keep this in mind as we explore learner assessment. We will add program evaluation later in this book.

Formative and Summative

Both assessments and evaluations can be either formative or summative.

Formative assessments are intermediary assessments that occur in the middle of the learning process and their primary purpose is to provide feedback to improve student learning. Formative assessments typically cover a specific segment of the material.

Summative assessments occur at the end of the course and are intended to assess the student achievement at the end of the course. You can consider a final assignment or final exam as a summative assessment.

Criterion and Norm referenced assessments

Assessments can be either norm referenced (ranked) or criterion referenced (competency).

Norm referenced tests are used to compare students to one another. You will be familiar with them as national standardized tests are norm referenced. These tests take a long time to develop and require special training to develop.

Criterion referenced tests are used to validate or help students learn specific things. In this course we will be focused on criterion referenced tests. These are what most instructional designers create, as their purpose aligns with the purpose of the courses we create.

Traditional and Authentic Assessment

Traditional assessments consist of the assessments that you are familiar with from school – those include quizzes, tests, and essays. This type of assessment focuses on *the knowledge of the learner*.

Authentic assessments, on the other hand, are typically performance based. When designing authentic assessments, your goal is to make the assessment as close to what is done in the performance context as possible. For example, rather than quizzing you on how to write a good learning objective, which would test your knowledge about learning objectives, I have you submit learning objectives for your specific instructional design documents. The creation of an instructional design document is a form of authentic assessment. Other forms of authentic assessment include creating portfolios, demonstrating skills, and simulations.

Assessment of Learning versus Assessment for Learning



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Assessment can be done as a way to help the instructor determine what a student needs. In this way, you are assessing for learning. When you assess for learning, the information gained from the assessment is used to help direct future learning.

Assessment of learning is a way to measure whether or not a student has learned the material. When you are doing assessment of learning, you are not necessarily using that information for learning purposes, rather, the focus is on measurement.

Creating Criterion Referenced Learner Assessments



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The criterion we use for creating assessments are the learning objectives. In this step of the instructional design process we look at each of our learning objectives and ask, how will we validate that the learner has successfully achieved the learning objective?

Creating learning objectives that are measurable makes this process a lot easier. This is largely why we create learning objectives using Bloom's verbs – because those verbs are measurable.

Read through your learning objectives and ask, how can I validate that learners have achieved this objective?

Learner Assessment Example

For the learning objective: Instructional design students will be able to write learning objectives with the aid of this document 100% of the time.

The assessment might be to give learners a goal and task analysis and ask them to write learning objectives that align with that analysis. This could be done as a test or as an assignment. Either way, the instructor is able to see the learner demonstrate their ability to write learning objectives.

Writing Clear Instructions

Regardless of the type of assessment you are creating, one of the most challenging part of assessment design is writing clear instructions. It is a good idea to have someone read your instructions and provide you with feedback before you provide them to students.

The best place to learn how to write clear instructions is by looking at the basics of technical writing, which is all about writing instructions.

General writing tips

Writing clear instructions is difficult. Here is a humorous example of writing clear instructions:



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- Avoid jargon and complex language. Keep your sentences short and clear.
- Use bulleted lists for things that don't need to be done in a specific order.
- Use numbered lists for things that must be done in a specific order.

- Start lists with verbs and use parallel structures (notice how each item in this list starts with a verb).

What is meant by writing clearly and concisely:



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Assessment writing recipe

1. State the purpose of the assessment. You can use the learning objective for this statement. For example, “The purpose of this assignment is to validate that you know how to write learning objectives that are SMART”.
2. Provide any background information and resources needed for students to be successful.
3. Describe what you want the learner to do.
4. Describe how the learner will be graded.
5. Ask someone else to proofread your instructions and ensure they understand them correctly.

Rubrics

Rubrics are tools for grading authentic assessments. They are useful when you have multiple people grading to help ensure consistency. They are also useful to help set expectations for students. However, rubrics can also stifle student creativity, as

they will do exactly what they need to do in order to achieve the highest level of the rubric and often nothing more.

There are many online tools to help your create rubrics.

11. Instructional Strategy

Instructional Strategy is the last chapter in the Design phase of ADDIE. In this chapter we will be looking at how the instructional will actually be delivered.

The instructional strategy is the plan (road map) for how the instruction will be delivered. It is not the content itself, rather it is a plan.

Dick and Carey define the instructional strategy as describing the general components of a set of instructional materials and the procedures used with those materials to enable student mastery of learning outcomes.

If you imagine you have been asked, as a consultant, to create a training plan for a new product. That training plan doesn't involve the creation of materials yet – rather it is a road map or proposal for your recommended approach to the instruction.

Instructional strategies contain different levels of detail depending on where in the approval process the training falls.

In this chapter, we look at instructional strategies with the viewpoint, that you are not doing the teaching. You will look at your material and provide a roadmap for someone else to deliver the instruction.

We address delivery mechanisms, content organization, learner motivation, and learner groupings. Selection of media will be addressed in a future chapter.

Overview of Instructional Strategy (12 minutes)



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Montes, B. (2014, February 12). [Developing an Instructional Strategy](https://youtu.be/4BS6C0dJPUE). <https://youtu.be/4BS6C0dJPUE>

Delivery System



Now that you know the content that you need to teach, and you have a good understanding of your audience, you are in a position to determine the optimal delivery strategy.

In many cases the delivery system is selected for us – in that it is pre-determined whether the course will be offered face-to-face, online, as a webinar, etc. However, in an ideal world, we would like the content and the characteristics of our learners to help decide the delivery system.

There is a lot of research out there that says that there is “no significant difference” between delivery systems. The thing that affects instruction is good design for that system. That is,

a good face-to-face design is not the same as a good online design. But if you use a good face-to-face design and compare it with a good online design, overall, there will be no significant difference in the effectiveness of the instruction. Every time a new delivery medium is created, there is a flood of research comparing it to previous – and every time the results are the same.

What does this mean – it means design to the medium that you are using – take full advantage of the characteristics of the medium when you are creating your instructional strategy.

Organizing Content

Dick, Carey & Carey (2014) describe “The five phases to planning the cognitive instructional strategy for a unit of instruction are as follows:

1. Sequence and cluster objectives.
2. Plan preinstructional, assessment, and follow-through activities for the unit, with notes about student groupings and media selections.
3. Plan the content presentations and student participation sections for each objective or cluster of objectives, with notes about student groupings and media selections.
4. Assign objectives to lessons and estimate the time required for each.
5. Review the strategy to consolidate media selections and confirm or select a delivery system.” (p. 234)

There are many different ways to organize your instruction, below I describe some of the more common ones: sequence, cluster, and conceptual frameworks.

When putting content into “lessons”, I try to make sure I have

a balance of conceptual material with practice skills, so I'm not overloading students with memorization early on in the course. One thing to consider in your course organization is [cognitive load](#) – “because short-term memory is limited, learning experiences should be designed to reduce working memory ‘load’ in order to promote schema acquisition” ([Heick, T., 2020, May 4](#)).

Sequencing

Sequencing involves organizing your learning objectives in a sequential manner based upon when the learner needs to know or do something. Depending on your topic, your task analysis may have outlined a logical sequence for your material.

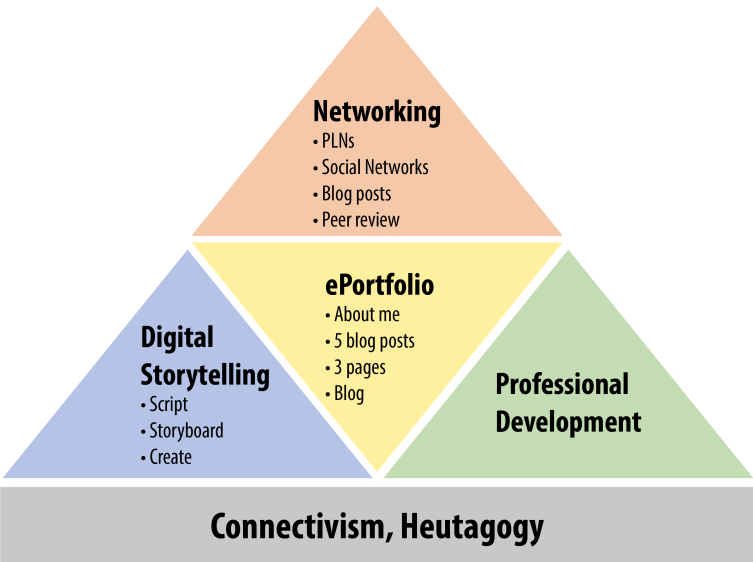
Clustering

Clustering involves breaking up learning into manageable sizes. Research shows that retention is improved when information is presented in **groupings of 7 plus or minus 2**. Ever wonder why phone numbers are giving in groups of three and four digits? This is because it is easier for us to remember numbers when they are chunked into smaller groupings. This also applies to learning content. Try to keep your groupings of learning objectives to between 5 and 9 (7 plus or minus 2) for each lesson. Personally, I like to use 5 or 6.

Conceptual Frameworks

Conceptual frameworks are visual representations of the structure of your course. I like to use conceptual frameworks to

provide a roadmap to students, so they know where they are within the course. In my Foundations course, I use ADDIE as a conceptual framework, as I have done in this book. Here is another example of a conceptual framework that I use:



Course Conceptual Framework for INSDSG 651: Designing your online professional presence. This course is based upon the foundational learning theories of Connectivism and Heutagogy. It involves four components, Digital Storytelling, Networking, Professional Development, and an ePortfolio.

Learner Motivation

In addition to the logical flow of information, you also need to consider the ways learner motivation impacts the instruction. There are several theories to help us build learner motivation into our instructional designs. These include: Keller’s ARCS, Gagné’s Conditions of Learning, Gagné’s 9 Steps of Instruction.

These theories help inform how we take the requirements for training and convert that into an instructional plan that works.

Keller's ARCS

Keller's ARCS – which stands for Attention, Relevance, Confidence, and Satisfaction addresses the things that you can build into your lessons / designs in order to foster motivation in your learners.

ARCS is a process.

That is, you first gain attention, then point out relevance. As student learn you help to build their confidence in the topic, and then finally you reinforce learning with rewards.

For more information, check out this video by Kevin Thorn



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view it online here: <https://id.rjhogue.name/foundations/?p=106>

Gagné's Nine Events of Instruction

Gagné defined nine events that outline the conditions necessary for learning to take place. In essence, he provides a roadmap for creating a lesson.

The conditions are:

1. Gain Attention
2. State objectives

3. Stimulate recall
4. Present content
5. Provide guidance
6. Elicit performance
7. Provide feedback
8. Assess performance
9. Enhance transfer

For more information, check out this video by Devlin Peck.



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Learner Groupings

Learner groupings describes any special ways you wish to have the learners grouped. That is, if the class you are designing is going to be taught 10 times, do you want specific sets of learners to take the course together.

For example, if you are teaching in the corporate sector and you have employees located in 5 locations, you may wish to specify that the learners will be grouped by physical location.

You may also choose to group learners by skill level or by some other demographic, such as age.

In some cases, you may say that you want to have learners with a variety of backgrounds. For example, in the uMass instructional design program we want to have learners who are interested in the corporate sector, higher ed, government,

health care, etc all in the same class. We want a diverse grouping of students so that they can bring different perspectives into the classroom.

The question for you to answer in your instructional strategy is, is there a specific way you wish learners to be grouped?

Note that this refers to groups from the perspective of course “section”, not from the perspective of teamwork within courses.

Test Your Learning



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view it online here:

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PART IV

DEVELOP

The second D in ADDIE stands for Develop

Tasks

Analyze



- Needs assessment
- Define instructional goals
- Describe context
- Describe learners
- Analyze instructional goals
- Task analysis

Common Tools

- Survey software (Google forms, SurveyMonkey)
- Drawing (PowerPoint, Draw.io)
- Curation tools (Google sites, Wakelet)

PART V

IMPLEMENT

The I in ADDIE stands for Implement.

Tasks

Analyze



- Needs assessment
- Define instructional goals
- Describe context
- Describe learners
- Analyze instructional goals
- Task analysis

Common Tools

- Survey software (Google forms, SurveyMonkey)
- Drawing (PowerPoint, Draw.io)
- Curation tools (Google sites, Wakelet)

PART VI

EVALUATE

The E in ADDIE stands for Evaluate. This is perhaps one of the most important parts of an instructional designers job, and yet it is one that is most often neglected.

Tasks

Analyze



- Needs assessment
- Define instructional goals
- Describe context
- Describe learners
- Analyze instructional goals
- Task analysis

Common Tools

- Survey software (Google forms, SurveyMonkey)
- Drawing (PowerPoint, Draw.io)
- Curation tools (Google sites, Wakelet)

PART VII

REBECCA'S DICK & CAREY NOTES

This appendix contains Rebecca's Notes on the Textbook Dick, W., Carey, L., & Carey, J. O. (2015). *The systematic design of instruction* (Eighth ed.). Boston: Pearson.

Chapter 1: Introduction to Instructional Design

Here are the specific things that I highlighted when reading chapter 1 of Dick & Carey.

“a more productive approach is to view e-learning—and indeed, all purposeful teaching and learning—as systematic processes in which every component is crucial to successful learning.”

“A system is technically a set of interrelated parts, all of which work together toward a defined goal. The parts of the system depend on each other for input and output, and the entire system uses feedback to determine if its desired goal has been reached.”

“the instructional process itself can be viewed as a system whose purpose is to bring about learning. The components of the system are the learners, the instructor, the instructional materials, and the learning environment, all interacting to achieve the goal.”

“If student achievement is not satisfactory, then components must be modified to make the system more effective and bring about the desired learning outcomes.”

This is interesting as it provides an example of how something could be a student assessment as well as a formative evaluation of the instruction.

“The purpose of this book is to describe a systems approach for the design, development, implementation, and evaluation of instruction. This is not a physical system, such as home heating and air conditioning, but a procedural system. We describe a series of steps, all of which receive input from preceding steps and provide output for the next steps. All components work together to either produce effective

instruction or, if the system evaluation component signals a failure, determine how instruction can be improved.”

“Although our model of instructional design is referred to as a systems approach model, we must emphasize that there is no single systems approach model for designing instruction. A number of models bear the label systems approach, and all share most of the same basic components. The systems approach model presented in this book is less complex than some, but incorporates the major components common to all models, including analysis, design, development, implementation, and evaluation. Collectively, these design models and the processes they represent are referred to as instructional systems development (ISD). Instructional design (ID) is used as an umbrella term that includes all phases of the ISD process. These terms all become clear as you begin to use the instructional design process.”

“Throughout this text, we define the term instruction quite broadly as purposeful activity intended to cause, guide, or support learning.”

“Constructivism is a relatively recent branch of cognitive psychology that has influenced the thinking of many instructional designers. Although constructivist thinking varies broadly on many issues, the central point is the view of learning as a unique product “constructed” by each individual learner combining new information and experiences with existing knowledge. Individuals learn by constructing new mental representations of the social, cultural, physical, and intellectual environments in which they live. Because learning in the constructivist view is so entwined with personal experiences, a primary role of the teacher is creating appropriate learning environments—that is, social or technological contexts in which student learning is based on interactions with authentic representations of real practices.”

“Throughout this text, readers will find predominately a cognitivist view of teaching and learning, but will also see

elements of constructivist thinking adapted as appropriate for the varieties of learners, learning outcomes, learning contexts, and performance contexts that are discussed.”

You may find yourself asking why this course and other courses in the instructional design program don't feel like courses designed using this method of instructional design. This is largely because most courses on this program I designed based upon a socio-constructivist worldview.

“Although some instructional theorists may question the model as forcing practices counter to their philosophical foundations, the authors counsel an open-minded view and believe that most instructional design practices advocated in the model, when used by expert professionals, are essentially neutral.”

“The Dick and Carey Model is only a representation of practices in the discipline of instructional design. The purpose for the model is to help you learn, understand, analyze, and improve your practice of the discipline, but all models are oversimplified representations. As you grow in understanding, don't confuse the representation with the reality. The graphical arrangement of boxes and arrows, for example, implies a linear process flow, but any experienced instructional designer will attest that in practice, the process can sometimes look more like the circular, continuous improvement model in Figure 1.1 or the concurrent processes model in Figure 1.2 that is useful when planning, development, implementation, and revision all occur at the same time or in multiple cycles of simultaneous activities.”

“Identify Instructional Goal(s)

The first step in the model is to determine what new information and skills you want learners to have mastered when they have completed your instruction, expressed as goals.”

“Conduct Instructional Analysis

After you have identified the instructional goal, you determine

step by step what people are doing when they perform that goal as well as look at subskills needed for complete mastery of the goal. The final step in the instructional analysis process is to determine what skills, knowledge, and attitudes, known as entry skills, are needed by learners to be successful in the new instruction."

"Analyze Learners and Contexts

In addition to analyzing the instructional goal, there is a parallel analysis of the learners, the context in which they learn the skills, and the context in which they use them. Learners' current skills, preferences, and attitudes are determined along with the characteristics of the instructional setting and the setting in which the skills will eventually be used."

Note that this is a parallel step, it's a bit confusing the order in which it is presented. I personally find that I need understand the context in order to even write the goals.

"Write Performance Objectives

Based on the instructional analysis and the description of entry skills, you write specific statements of what learners will be able to do when they complete the instruction."

"Develop Assessment Instruments

Based on the objectives you have written, you develop assessments that are parallel to and that measure the learners' ability to perform what you describe in the objectives."

This is a form of backwards design, where you designed the test before you designed the instruction.

"Develop Instructional Strategy

Based on information from the five preceding steps, a designer identifies a theoretically based strategy to use in the instruction to achieve the goal that emphasizes components to foster student learning"

What's included in the list below is very much based upon a cognitive understanding of learning.

"Develop and Select Instructional Materials

In this step, the instructional strategy is used to produce the

instruction, and typically includes guidance for learners, instructional materials, and assessments”

“Design and Conduct Formative Evaluation of Instruction
Following completion of a draft of the instruction, a series of evaluations is conducted to collect data used to identify problems with the instruction or opportunities to make the instruction better, called formative because its purpose is to help create and improve instructional processes and products.”

You might be familiar with the term beta, as in a product being in beta.

“Revise Instruction

The final step in the design and development process (and the first step in a repeat cycle) is revising the instruction.”

“Among the reasons that systematic approaches to instructional design are effective is the required focus, at the outset, on what learners are to know or be able to do when the instruction is concluded.”

“A systems approach to instruction is a powerful tool for planning successful standards-based education because of the tight alignment among learning outcomes, student characteristics, instructional activities, and assessments.”

“A second reason for using the systems approach is the interlocking connection between each component, especially the relationship between instructional strategy and desired learning outcomes. Instruction specifically targeted on the skills and knowledge to be learned helps supply the appropriate conditions for these learning outcomes. Stated another way, the instructional range of activities cannot be loosely related or unrelated to what is to be learned.”

Aka focus which is especially important when you're designing for workplace learning.

“The third and perhaps most important reason for using the systems approach is that it is an empirical and replicable process.”

I'm particularly challenged by this premise, as it's based

upon the belief that the mind is an empty vessel in which knowledge could be poured into, and doesn't truly take into account for learner differences.

"The systems approach is an outcomes-based approach to instruction because it begins with a clear understanding of the new knowledge and skills that students will learn."

"it is the analysis process and the instructional strategies, rather than the delivery mode, that determine instructional success."

"The reader should be careful to distinguish between the process of designing instruction and the delivery of that instruction."

"As you study the instructional design model and perhaps use it to design specific instruction, you will find that it takes both time and effort. If you are a teacher, you may find yourself saying, "I could never use this process to prepare all my instruction," and you would probably be correct. The individual instructor with day-to-day instructional responsibilities can use the complete process to develop only small amounts of instruction at any given time because of the level of detail included in each step."

I think this is a poor example, because of the no individual teacher because it is too cumbersome, but you also don't design a lot of your own material, you draw upon curriculum that is created by others, and that curriculum is created by instructional designers.

"I think this is a poor example, because of the no individual teacher because it is too cumbersome, but you also don't design a lot of your own material, you draw upon curriculum that is created by others, and that curriculum is created by instructional designers."

"In contrast to the teacher who may be working alone, the ID professional sometimes works with a team of specialists to develop the instruction, often including a content specialist,

an instructional technologist, an evaluation specialist, and a manager (who is often the instructional designer).”

Chapter 2: Identifying Instructional Goals Using Front-End Analysis

Here are the thing I highlighted when I read the chapter 2:

“The instructional goals established by SMEs often contain words such as know and understand with regard to content information. This approach to the teaching–learning process assumes that students need to learn what the SME knows, and emphasizes the communication of information from instructor to student in the instructional process.” (p.16)

“Another danger is assuming that new instruction or more instruction will solve the problem when, in fact, the problem may be because of lack of accountability, lack of incentives, outdated tools, organizational culture, or some other factor.” (p. 16)

Is instruction the right solution to the problem?



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“Instructional designers favor a fourth approach, performance technology, in which instructional goals are set in response to problems or opportunities within an organization. This is

also referred to as human performance technology and performance improvement.” (p.16)

“The model we use throughout this text is to guide the design, development, and revision of instruction. It has long been accepted that careful analysis is absolutely critical prior to initiating the design of instruction. This analytical work is sometimes referred to as front-end analysis, and typically includes performance analysis, needs assessment, and in some cases job analysis.” (p.17)

“An important consideration in selecting a solution is cost, and instruction is often one of the more expensive alternative solutions. Experience has shown that under careful analysis, many organizational problems that previously were addressed by training are now solved via multicomponent solutions that may or may not include training.” (p.21)

“The logic of needs assessment can be summarized as a simple equation:

Desired status – Actual status = Need

Needs assessment is sometimes called discrepancy analysis. The discrepancy is the observed difference between the desired status and the actual status.” (p.23)

“Careful descriptions of both desired and actual status are required, because a gap or need is defined as a comparison between the two.” (p. 23)

“If performance analysis indicates that training is one of the best solutions for a performance problem, then needs assessment is used again, and is called training needs assessment or learning needs assessment, and results in instructional goals for beginning an instructional design project.”(p. 23)

“Needs assessment is a critical component of the total design process. Trainers and educators must be aware that the creation of unnecessary instruction has a tremendous cost in dollars and encourages detrimental attitudes in students

involved in pointless learning activities and managers paying for training that does not solve problems.” (p. 24)

“An important component of front-end analysis is job analysis, or the process of gathering, analyzing, and synthesizing descriptions of what people do in their jobs.”(p. 24)

“In summary, instructional goals are ideally derived through a process of performance analysis that establishes rather broad indications of a problem that can be solved by providing instruction.” (p.25)

“A fuzzy goal is generally some abstract statement about an internal state of the learner, such as appreciating, having an awareness of, and sensing. These kinds of terms often appear in goal statements, but the designer does not know what they mean because there is no indication of what learners would be doing if they achieved this goal.” (p.26)

“To analyze a vague goal, first write it down. Then indicate the things people could do to demonstrate that they had achieved that goal or what they would be doing if they were performing the goal.” (p.26)

“Whereas the most important aspect of an instructional goal is the description of what learners will be able to do, that description is not complete without an indication of (1) who the learners are, (2) the context in which they will use the skills, and (3) the tools that will be available.” (p. 26)

“Likewise, from the very beginning, a project designer must be clear about the context in which the skills will be used and whether any aids or tools will be available. We refer to this as the performance context.” (p. 26)



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“A complete goal statement should describe the following:

- The learners
- What learners will be able to do in the performance context
- The performance context in which the skills will be applied
- The tools that will be available to the learners in the performance context” (p.27)

“Any selection of instructional goals must be done in terms of the following three concerns:

1. Will the development of this instruction solve the problem that led to the need for it?
2. Are these goals acceptable to those who must approve this instructional development effort?
3. Are there sufficient resources to complete the development of instruction for this goal?” (p.27)

Chapter 3: Conducting a Goal Analysis



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view it online here: <https://id.rjhogue.name/foundations/?p=68>

Once you figure out which one of Gagne's domain's of learning your project fits into, read that section in more detail.

"The goal should be a clear statement of what learners will be able to do." (p. 41)

I prefer to say what someone who already has the skill is able to do – what does the expert do?

"The first question for the designer, following the identification of an instructional goal, is 'What exactly would learners be doing if they were accomplishing the goal successfully?' (p.42)

"It should be stressed that the goal-analysis approach is not the only way to identify content that should be included in a set of instructional materials." (p.42)

This just says that there are other instructional design models out there that approach this differently.

"The first step is to categorize the goal into one of Gagné's (1985) domains of learning" (p.42)

I'm not a huge fan of Gagné's domains of learning; however, it is used throughout the text, so important to know which

domain your project falls under, so you can focus on that domain when you do your readings.

“The highest level of intellectual skill is problem solving, and there are two types of problems: well-structured problem solving and ill-structured problem solving.” (p.43)

“There is no better example of an ill-structured problem than the instructional-design process itself.” (p. 44)

This is the idea that instructional design is complex. There is no one solution to the problem of designing instruction.

“If the learner must learn to execute new, nontrivial motor skills, or performance depends on the skillful execution of a physical skill, we refer to it as a psychomotor goal.” (p.44)

“Another characteristic of attitudinal goals is that they probably will not be achieved at the end of the instruction.” (p.45)

The Dick & Carey model does not work well with attitudinal goals.

“The smaller the goal, the easier it is to do a precise analysis of what is to be learned.” (p.46)

Note: Notice how the steps are presented in a linear fashion – in reality not all projects break down so neatly. You may need to abstract in order to come up with a list of things rather than linear steps.

“Regardless of how large the steps should be, the statement of each step must include a verb that describes an observable behavior.” (p.47)

Tip: Use the upper four levels of Bloom’s taxonomy to find the right observable verbs. We have routinely observed that novice designers tend to list the steps they would follow in teaching a goal rather than the steps that a learner should use in performing the goal.

“Another problem in conducting a goal analysis is the inclusion of skills and information that are “near and dear” to the designer but are not really required for the performance of the goal.” (p.51)

Chapter 4: Identifying Subordinate and Entry Skills

Tip: Choose one or two of the tasks identified in your goal analysis. Then, as you read through the text, find the sections that apply to your task, and work through the subordinate and entry skills analysis for that task. Try out each of the visual methods and the text method and figure out which works best for you.

“After the steps in the goal have been identified, it is necessary to examine each step to determine what learners must know or be able to do before they can learn to perform that step in the goal. This second step in the instructional analysis process is referred to as subordinate skills analysis.” (p.61)

I have called this is the knowledge and skills analysis, because you are taking the subgoal (or task) and breaking it down into the knowledge and skills necessary to perform the task.

“The identification of either too many or too few skills can be a problem.” (p.61)

Knowing your learner is really important for determining the level of detail required in the analysis. My general tip is to go to one level of prerequisite – so, once you hit a prerequisite skill or knowledge, stop.

“The hierarchical analysis approach is used to analyze individual steps in the goal analysis that are classified as intellectual or psychomotor skills.” (p. 62)

“What must the student already know so that, with a minimal amount of instruction, this task can be learned?” (p.62)

This is the question to determine entry skills – that is prerequisite for the course.

“One way to proceed is to ask, “What mistake might students make if they were learning this particular skill?”” (p.66)

This is a great question to ask subject matter experts. This information can also be used for creating learning scenarios.

“it may be necessary to modify the goal statement” (p.66)
You will find that you are constantly going back and updating in order to ensure things are in alignment.

“You may also find that you have included skills that are nice to know but are not really required in order to achieve your goal.” (p.66)

“The whole point of using the hierarchical approach is to identify just what the learner must know to be successful—nothing more, and nothing less.” (p.67)

One of the intentions of this type of instructional design is to create efficient training – and that means not including content that is not required in order to meet the instructional goal. That being said, you may find that you need to add content to improve learner motivation, but we deal with that later. For now, we are focused on the minimum information and skills needed to perform the task.

“The steps and substeps are the activities that an expert or a competent person would describe as the steps in the performance. The subordinate skills are not necessarily identified by a competent person when describing the process. These are the skills and knowledge that learners must learn before they can perform the steps in the goal. For example, if you are teaching someone to boil water, one of the steps is “Turn on the burner.” One of the subordinate skills for that step is “Identify examples of burners.” If you were actually boiling water, you would never say, “This is the burner”; you would simply put the pan with the water on the burner. Obviously, you must recognize a burner, but verbally identifying it is not a step in the process of boiling water.” (p.67)

This gets to the heart of the difference between the task (or subgoal) and the knowledge / skill analysis. However this can feel like a fuzzy line – and in some cases it is. But in cases of the lower levels of Bloom’s taxonomy (such as identify and describe) – these are definitely things that happen as part of the knowledge / skills analysis not the task / subgoal analysis.

“It is sometimes embarrassing for teacher–designers to find that when instructional analysis techniques are used, an instructional goal that they have often taught and for which they would like to develop systematically designed instruction is, in fact, simply verbal information. They can feel guilty that they are not teaching rules and problem solving, but this guilt is sometimes misplaced. There are times when the acquisition of verbal information is critically important.” (p.68)

Verbal information is an interesting thing. We try to avoid too much of it, as it does not involve the application of the information – however, there are times when you just need students to know. For example, in language learning, students need to memorize certain vocabulary. There is no getting around that verbal information. It is not a bad thing. It is a reality in the design process.

“Why is the instructional analysis process so critical to the design of instruction? It is a process the instructional designer can use to identify those skills really needed by the student to achieve the terminal objective as well as to help exclude unnecessary skills.” (p.72)

The process can be used with subject matter experts when you do not understand the topic. It is also hugely valuable when you are trying to explain to someone why you are not including certain content in the course.

“Recall that we introduced the topics of job analysis and job task analysis in Chapter Two. There is a methodology called cognitive task analysis (CTA) that belongs with the concepts of job analysis and job task analysis fits into our discussion in this chapter on identifying subordinate skills. Practitioners

developed CTA methods because they understood that there are many mental processes going on inside an employee's head when performing a complex job, and that much of this processing could not be detected by simple observation of the employee performing the tasks. Some mentally challenging tasks may even be performed totally in the mind of the employee and could result in nothing more than a single new line of computer code, or a verbal statement such as 'Insert that needle right here!'" (p.72)

There is something called Think Aloud Protocol that is used in a variety of settings such as user interface testing and research – where the participant is asked to say out loud everything that they are thinking while they perform a task. This helps to identify those hidden steps in the process.

"Because CTA can be expensive and time consuming, it is often applied in the development of more complex types of training and human factors solutions, such as electronic performance support systems, training simulators, human-machine and human-computer interface designs, and computer-based simulations and expert systems." (p.73)

"It helps the designer identify exactly what learners must already know or be able to do before they begin the instruction, called entry skills because learners must already have mastered them in order to learn the new skills included in the instruction." (p.73)

"It is important to make a distinction between the target population and what we refer to as tryout learners. The target population is an abstract representation of the widest possible range of users, such as college students, fifth graders, or adults. Tryout learners, in contrast, are learners available to the designer while the instruction is being developed. It is assumed that these tryout learners are members of the target population—that is, they are college students, fifth graders, and adults, respectively. However, the tryout learners are specific college students, fifth graders, or adults. While the

designer is preparing the instruction for the target population, the tryout learners serve as representatives of that group in order to plan the instruction and to determine how well the instruction works after it is developed.” (p.96-97)

Chapter 5: Analyzing Learners and Contexts

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This idea of tryout learners is not one that I have experienced in the past. Instead what we have done is a pilot delivery of the training, where the students are all people who will be teaching the material. We call this train-the-trainer (T3) for short. Using the trainers as students helps get to the delivery of the final course faster; however, they are not necessarily typical learners. They do, however, give really good feedback especially if there are errors or omission in the instructional materials.

“Many instructors consider the motivation level of learners the most important factor in successful instruction.” (p. 97)

“Called the ARCS model (attention, relevance, confidence, and satisfaction), the model is discussed in detail in Chapter Eight; it is used here to show how to obtain information from learners during the learner analysis.” (p.97)

We don't really cover ARCS in this course, however, it is

covered in more depth in INSDSG 602 – The adult as learner. It is also an option for the group project.

“Research indicates that personal styles can be identified, but such styles are often derived from learners’ expressions of personal preferences for listening, viewing, reading, small-group discussion, and so forth, rather than measurement of psychological traits that predict how a student learns best.” (p. 98)

Think of this in the context of the Urban Legends reading. I recommend that anyone who needs to replacement for learning styles, take a look at Universal Design for Learning. There is a course in this program (an elective) on UDL that is only offered in the summer. The course is often a highlight for students.

“A sample of the whole group could be taken to develop an in-depth profile of a prototypical learner, known as developing personas ; that is, fictional persons who represent predominant characteristics of intended learners.” (p.99)

The idea of personas are used in other design fields, especially human factors / experience designers such as user interface designers. Creating personas is a good skill to have, especially if you are working in a technology company.

“For higher-order learning, a careful context analysis is critical for aiding the designer in recreating authentic elements of the performance context during instruction and enabling the learner to build optimal conceptual frameworks for learning and remembering.” (p. 99)

“Research indicates that one of the strongest predictors of use of new skills in a new setting (called transfer of learning) is the support received by the learner.” (p.100)

Dick & Carey call it transfer of learning. In my experience it is called knowledge transfer or technology transfer. In a previous life, my job was to teach customers how to use our product (telephone equipment providers like AT&T). I was a Technology Transfer Analyst.

In health care research it is called implementation research, and the goal is to take knowledge that is theoretical and figure out how to implement it in a real world context.

“The decision may not have been made based on an analysis of the capability of the technology to deliver the desired instruction.” (p.102)

“Most experienced designers have, at one time or another, regretted the omission of constraints analysis in the design process.” (p.102)

This is especially true if you are working freelance. Not doing this analysis up front can lead to significant project scope creep.

“Constructivist theorists have been justifiably sharp in their criticism of teaching/learning activities that are abstracted from, and thus not relevant to, authentic physical, social, and problem contexts.” (p.103)

Don't worry yet about what constructivist is. We will cover that when we look at learning theories later in the course. The important part of this quote is the need to try to get your learning environment to be as close to the performance context as possible.

“As instructional designers do their work, they frequently ‘circle back’ to fine-tune earlier decisions based on new information discovered as they progress through the ID process.” (p.105)

This is important. As we do additional parts of the analysis, we will find that we had made assumptions earlier and we need to change those assumptions or document the assumptions. Often when you get to the subordinate skills analysis (next week), you find things like prerequisite skills that may require you to redefine who your learners are. That is OK. It is normal that with each step there is a need to go back and make sure everything previously done aligns. Sometimes that causes you to fix the current analysis, other times it causes you to adjust the previous analysis.

Chapter 6: Writing Performance Objectives

If you have taken a workshop on training, chances are this is where you started. Often workshops jump in immediately with learning objectives without doing the initial phases of the design process.

“Perhaps the best-known part of the instructional design model is the writing of performance objectives, or, as they are often called, behavioral objectives” (p.117)

Note the term behavioral – as the focus on learning objectives is creating objectives that are observable – which aligns with behaviorist learning theory.

“Although instructors could master the mechanics of writing an objective, there was no conceptual base for guiding the derivation of objectives. As a result, many teachers reverted to the tables of contents in textbooks to identify topics for which they would write behavioral objectives.” (p.117)

“what to do with the objectives after they were written. Many instructors were simply told to incorporate objectives into their instruction to become better teachers. In reality, most objectives were written and then placed in desk drawers, never to affect the instructional process.” (p.117-118)

“Summary analyses of the research findings indicate a slight but significant advantage for students who are informed of the objectives for their instruction.” (p.118)

Learning objectives act as an “advanced organizer” helping learners know what is coming next and knowing what to focus on.

“Objectives are critical to the design of instruction, regardless

of whether they are presented to learners during instruction.” (p.118)

“Knowledge of intended outcomes aids students in linking new knowledge and skills to their current knowledge and experiences.” (p.118)

“many educators acknowledge that writing objectives in areas such as humanities or interpersonal relations is more difficult than in other disciplines.”(p.118)

“the development of objectives supports these instructors by taking them through the following tasks: (1) specifying the skills, knowledge, and attitudes they will teach; (2) determining the strategy for instruction; and (3) establishing criteria for evaluating student performance when instruction ends” (p.118)

“In summary, the goal is a statement of what students will be able to do in the performance context that you described in Chapter Five. The goal is rephrased as a terminal objective describing what students will be able to do in the learning context, and subordinate objectives describe the building-block skills that students must master on their way to achieving the terminal objective.” (p.119)

“The first part describes the skill identified in the instructional analysis, describing what the learner will be able to do.” (p.120)

“This component contains both the action and the content or concept.” (p.120)

“The second part of an objective describes the prevailing conditions while a learner carries out the task.” (p.120)

“The third part of an objective describes the criteria to be used to evaluate learner performance. The criterion is often stated in terms of the limits, or range, of acceptable answers or responses, indicating the tolerance limits for the response.” (p.120)

“Sometimes an objective may not convey any real information, even though it may meet the formatting criteria for being an objective.” (p.121)

"It has been stated that objectives are derived directly from the instructional analysis; thus, they must express precisely the types of behavior already identified in the analysis." (p.121)

"Sometimes, however, the designer may find that subskill statements are too vague to write a matching objective. In this circumstance, the designer should consider the verbs that may be used to describe behavior carefully." (p.121)

"The instructor must review each objective and ask, 'Could I observe a learner doing this?'" (p.121)

I usually ask the question, how will you know that your learner has succeeded?

"Objectives that relate to psychomotor skills usually are easily expressed in terms of a behavior (e.g., running, jumping, driving). When objectives involve attitudes, the learner is usually expected to choose a particular alternative or sets of alternatives." (p.122)

"Conditions refers to the exact set of circumstances and resources that will be available to the learner when the objective is performed." (p.122)

Objectives also help student focus their studies. If there are exams involved, they should align with the objectives. We'll talk more about that in the learner assessment module.

"The second purpose for including conditions in an objective is to specify any resource materials that are needed to perform a given task." (p.123)

"The third purpose for conditions is to control the complexity of a task in order to tailor it to the abilities and experiences of the target population." (p.123)

"The fourth purpose for conditions is aiding the transfer of knowledge and skill from the instructional setting to the performance setting." (p.123)

"The final part of the objective is the criterion for judging acceptable performance of the skill." (p.124)

"The important point is that the criterion in the objective

describes what behavior is acceptable, or the limits within which a behavior must fall.” (p. 124)

“To make objectives and subsequent instruction consistent with the context analysis, designers should review the goal statement before writing objectives.” (p.125)

“The second step is to write a terminal objective. For every unit of instruction that has a goal, there is a terminal objective. The terminal objective has all three parts of a performance objective, and its conditions reflect the context available in the learning environment. In other words, the goal statement describes the context in which the learner will ultimately use the new skills, whereas the terminal objective describes the conditions for performing the goal at the end of the instruction.” (p.125)

“After the terminal objective has been established, the designer writes objectives for the skills and subskills included in the instructional analysis. The next step is to write objectives for the subordinate skills on the instructional analysis chart, including intellectual skills, verbal information, and, in some cases, psychomotor skills and attitudes.” (p.126)

“The steps in writing objectives are as follows:

1. Edit goal to reflect eventual performance context.
2. Write terminal objective to reflect context of learning environment.
3. Write objectives for each step in goal analysis for which there are no substeps shown.
4. Write an objective for each grouping of substeps under a major step of the goal analysis, or write objectives for each substep.
5. Write objectives for all subordinate skills.
6. Write objectives for entry skills if some students are likely not to possess them.” (p.126)

“Construct a test item to be used to measure the learners’

accomplishment of the task, and if you cannot produce a logical item yourself, then the objective should be reconsidered. Another way to evaluate the clarity of an objective is to ask a colleague to construct a test item congruent with the behavior and conditions specified. If the item produced does not resemble closely the one you have in mind, then the objective is not clear enough to communicate your intentions.” (p.127)

“Do not be reluctant to use two or even three sentences to describe your objective adequately.” (p.126)

**“Objectives do not specify how a behavior will be learned.”
(p.126)**

“The best advice at this point is to write objectives in a meaningful way, and then move on to the next step in the instructional design process.” (p.127)

Chapter 7: Developing assessment instruments

“Learner-centered assessments are to be criterion-referenced (i.e., linked to instructional goals and an explicit set of performance objectives derived from the goals).” (p.137)

“You may wonder why test development appears at this point in the instructional design process rather than after instruction has been developed. The major reason is that the test items must correspond one to one with the performance objectives.” (p.138)

Remember the system design slides. This is a key idea – the one-to-one correspondence between test items and learning objectives.

“The main purpose for a criterion-referenced test is to examine a person’s or group’s achievement in a carefully defined content area; thus, it is focused on specific goals and objectives within a given content area. In contrast, norm-referenced tests are used to compare the relative performance of learners in larger areas of content, such as a year’s content within a specific subject area; for example, mathematics or reading.” (p.138-139)

“ criterion-referenced tests are the backbone of the assessment used for decision making in the development and evaluation of particular instruction” (p.139)

“It should be noted that if there are no significant entry skills identified during the instructional analysis, then there is no need to develop corresponding objectives and test items.” (p.139)

“The purpose of a pretest is not necessarily to show a gain

in learning after instruction by comparison with a posttest, but rather to profile the learners with regard to the instructional analysis.” (p.139)

This too is important. The idea here is that the pretest is used to influence the actual instruction, not the design of the module.

“The purpose for practice tests is to provide active learner participation during instruction.” (p.140)

This misses a point – one of the reasons to do practice tests is for learning to practice how to write the test, as test writing is a skill in and of itself.

“Posttests are administered following instruction, and they are parallel to pretests, except they do not include items on entry skills.” (p.142)

“It is critical that test items measure the exact behavior described in the objective.” (p.143)

This is often much easier said than done!

“Test items and assessment tasks must be tailored to the characteristics and needs of the learners, including such considerations as learner needs, vocabulary and language levels, developmental levels for setting appropriate task complexity, motivational and interest levels, experiences and backgrounds, special needs, and freedom from bias (e.g., cultural, racial, gender).” (p.144)

“In creating test items and assessment tasks, designers must consider the eventual performance setting as well as the learning or classroom environment.” (p.145)

“Learners can be nervous during assessment, and well-constructed, professional-looking items and assessment tasks can make the assessment more palatable to them.

Test-writing qualities focusing on assessment-centered criteria include correct grammar, spelling, and punctuation, as well as clearly written and parsimonious directions, resource materials, and questions.” (p.145)

“In constructing the test, a major question that always arises

is, ‘What is the proper number of items needed to determine mastery of an objective?’”(p.146)

“Another important question to consider is, ‘What type of test item or assessment task best assesses learner performance?’” (p.146)

“Objective tests include test items that are easy for learners to complete and designers to score. The answers are short and typically scored as correct or incorrect, and judging correctness of an answer is straightforward. Objective formats include completion, short answer, true/false, matching, and multiple choice. Test items that should be scored using a checklist or rubric, including essay items, are not considered to be objective items, and they are described in the next section on alternative assessments.” (p.147)

“Developing alternative assessment instruments used to measure performance, products, and attitudes does not involve writing test items per se, but instead requires writing directions to guide the learners’ activities and constructing a rubric to frame the evaluation of the performances, products, or attitudes.”

Alternative assessments are often called authentic assessments.

“In addition to writing instructions for learners, you must develop a rubric to guide your evaluation of performances, products, or attitudes.” (p.149)

Note that rubrics are tools used to measure. They are grading tools, rather than assessment instruments. [I don't use rubrics – here is why](https://rjhogue.name/2017/12/10/why-i-dislike-rubrics-in-my-classes/): <https://rjhogue.name/2017/12/10/why-i-dislike-rubrics-in-my-classes/>

Chapter 8: Planning the instructional strategy: Theoretical bases

“As the title indicates, this chapter addresses the ways an instructional designer identifies how instruction engages learners. The term instructional strategy suggests a huge variety of teaching/learning activities, such as group discussions, independent reading, case studies, lectures, computer simulations, worksheets, and cooperative group projects. These are essentially microstrategies—pieces of an overall macrostrategy that must take learners from a motivational introduction to a topic through learners’ mastery of the objectives.” (p.173)

“The macroinstructional strategy (the complete instruction) is usually created by an instructor who must do nearly everything to bring about learning: define the objectives, write the lesson plans and tests, motivate the learners, present the content, engage the students as active participants in the learning process, and administer and score the assessments” (p. 173-174)

Note: You will notice that the macroinstructional strategy aligns with a lot of the instructional design document you are creating.

“Psychologists have been successful, however, in identifying several major components in the learning process that, when present, almost always facilitate learning. Three of these components are motivation, prerequisite and subordinate skills, and practice and feedback.” (p.174)

“Many of the psychologists whose work influenced the original approaches to instructional design forty to fifty years ago were behaviorists. Some behaviorist views were later modified by cognitive explanations of learning, with corresponding modifications and amplifications to the instructional design process. More recently, constructivists have made criticisms of instructional practices for higher-order learning and suggested new approaches.” (p.174)

“An instructional strategy describes the general components of a set of instructional materials and the procedures used with those materials to enable student mastery of learning outcomes.” (p.174)

- “The concept of an instructional strategy originated with the events of instruction described in cognitive psychologist R. M. Gagné’s *Conditions of Learning* (1985), in which he defines nine events that represent external instructional activities that support internal mental processes of learning:
Gaining attention
- Informing learner of the objective
- Stimulating recall of prerequisite learning
- Presenting the stimulus material
- Providing learning guidance
- Eliciting the performance
- Providing feedback about performance correctness
- Assessing the performance
- Enhancing retention and transfer” (p.174-175)

“To facilitate the instructional design process, Gagné’s events of instruction are organized here into five major learning components that are part of an overall instructional strategy:

- Preinstructional activities
- Content presentation

- Learner participation
- Assessment
- Follow-through activities (p.175)

Note how this aligns with the components mentioned above: motivation, prerequisite and subordinate skills, and practice and feedback

“One of the typical criticisms of instruction is its lack of interest and appeal to the learner. One instructional designer who attempts to deal with this problem in a systematic way is John Keller (2010), who developed the ARCS model based on his review of the psychological literature on motivation. The four parts of his model are Attention, Relevance, Confidence, and Satisfaction (summarized in Table 8.1). To produce instruction that motivates the learner, these four attributes of the instruction must be considered throughout the design of the instructional strategy.” (p.175)

“Bandura’s (1993) theory of self-efficacy predicts that students who believe in their ability to achieve a goal are more likely to do so than are students who doubt their ability.” (p.177-178)

I included some of these theorists in part because we mention them in 602 this week. If you aren’t in 602, don’t worry if there are too many names in here – focus on the ideas.

“Sweller (1994) warns that designers should be aware of the mental processing requirements that too much information and too many intellectual skills can place on a learner’s short-term memory (working memory). He uses the term cognitive load to refer to one’s capacity for holding new information and concepts in mind while processing them and fitting them into the body of knowledge already in permanent memory. Sweller’s article suggests ways that designers can manage the cognitive load in instruction.” (p.179)

“As described in Chapter One, the Dick and Carey Model is rooted in cognitive psychology, and we call it a cognitive

model. Constructivism also has roots in cognitive psychology and has two branches: cognitive constructivism and social constructivism. Social constructivism developed from the work of Russian psychologist Lev Vygotsky in the first part of the twentieth century. His views were similar in many respects to Piaget's developmental theories, but with greater emphasis on social context and social transmission of cultural and intellectual capabilities. Those interested in the origins of his theories may want to read edited translations of some of his original essays (Vygotsky, 1978)." (p.194)

"Driscoll (2005) describes five aspects of constructivism that should be considered in ID. These desired outcomes (goals) of learner-centered inquiry when supported by adaptive learning guidance are (1) reasoning, critical thinking, and problem solving; (2) retention, understanding, and use; (3) cognitive flexibility; (4) self-regulation; and (5) mindful reflection and epistemic flexibility." (p.196)

Driscoll is one of the best books on learning theory. If you want to learn more about learning theories, it is a great book to check out.

"Cognitive flexibility is the ability to adapt and change one's mental organization of knowledge and mental management of solution strategies for solving new and unexpected problems. Cognitive flexibility is engendered when students are exposed to multiple representations of the content domain and multiple solution strategies for the same problem and when students are challenged to examine and evaluate their own strategies for solving a problem." (p.199)

Chapter 9: Planning logistics and management for the instructional strategy

“In any kind of formal educational experience, there is usually a general methodology, referred to as the delivery system, for managing and delivering the teaching and learning activities that we call instruction. Delivery systems and instructional strategies are not synonymous. A delivery system is only part of an overall instructional strategy, and novice instructional designers must guard against being seduced by flashy technologies and ending up ascribing far too much weight to how instruction is packaged and delivered at the expense of the careful planning of the teaching–learning activities that should be included in the instruction. The delivery system is either an assumption that the designer takes into the development of an instructional strategy, or it is an active decision made as part of developing an instructional strategy. In either case, choosing a delivery system can be a lesson-level, course-level, or curriculum-level management decision.” (p.221)

“The third step in developing an instructional strategy (see Figure 9.1) is identifying a teaching sequence and manageable groupings of content. What sequence should you follow in presenting content to the learner? The most useful tool in determining the answer to this question is your instructional analysis. Begin with the lower-level skills, that is, those just above the line that separates the entry skills from the skills to be taught, and then progress through the hierarchy. At no point should you present detailed instruction on a particular

hierarchical skill prior to having done so for the related subordinate skills; however, it often is useful to introduce a higher-level skill first as an advanced organizer or as a whole-part-whole instructional sequence.” (p. 222-223)

“There are three exceptions to this general approach to sequencing. The first occurs when two or more steps in a goal are the same or have the same subordinate skills. In this situation, it is not necessary to teach these skills again.” (p. 223)

Note: This is a question that was asked by many students – for the duplicates you typically only need to teach it once.

“A third exception is when boredom would result from a predictable, tedious, step-by-step sequence. If this is the result, it is better to sacrifice some of the efficiency of the ideal sequence and break it up to sustain interest and motivation.” (p. 223)

“The next question in your instructional strategy deals with the size of the cluster of material you provide in your instruction.” (p.223)

“The primary question to ask when making decisions about student groupings is whether requirements for social interaction exist in the performance and learning contexts, in the statements of learning objectives, in the specific learning component being planned, or in one’s foundational views of the teaching process.” (p.224)

“This example illustrates the point of view in this chapter that media are useful to the extent that they effectively carry some or all of the various learning components of an instructional strategy.” (p. 225)

“When working under the constraint of an assigned or assumed delivery system, media selection becomes a choice among those formats available in that system.” (p.225)

“Indicate the sequence of objectives and how to cluster them for instruction.” (p. 231)

“Indicate your approach to the learning components of

preinstructional activities, assessment, and follow-through.” (p.232)

” Indicate the content to be presented and student participation activities for each objective or cluster of objective.” (p.233)

“Review your sequence and clusters of objectives, preinstructional activities, assessment, content presentation, student participation strategies, and student groupings and media selections.” (p. 233)

“Review the entire instructional strategy and anchored management decisions again to consolidate your media selections and either (a) confirm that they fit an imposed delivery system or (b) select a delivery system that is compatible with the learning and performance context.” (p. 233)

“The five phases to planning the cognitive instructional strategy for a unit of instruction are as follows:

1. Sequence and cluster objectives.
2. Plan preinstructional, assessment, and follow-through activities for the unit, with notes about student groupings and media selections.
3. Plan the content presentations and student participation sections for each objective or cluster of objectives, with notes about student groupings and media selections.
4. Assign objectives to lessons and estimate the time required for each.
5. Review the strategy to consolidate media selections and confirm or select a delivery system. (p. 234)

“A constructivist instructional strategy is quite different than the one just described, and it could be created in many different ways due to the flexibility afforded by a constructivist model.” (p. 243)

With sequencing in particular, I find that this is where the

art of instructional design meets the science. The textbook approaches it like a science, but there is a lot to be said about the art and the gut feelings about the way content should be structured.

Chapter 10: Developing instructional materials

“In a typical classroom setting, the instructor plans and performs functional activities that we describe as being components of an instructional strategy. The instructor is often the motivator, the content presenter, the leader of practice activities, and the evaluator. The instructor makes decisions that affect the whole group as well as individual students. Instructors are usually required to use strategies whereby they must move the whole class forward through a sequence of instruction, or retain the whole class at a particular point in the instruction until they believe that sufficient skill and knowledge have developed within a majority of the group.” (p. 251)

“We recommend that you produce self-instructional materials in your first attempt at instructional design—that is, the materials should permit the student to learn the new information and skills without any intervention from an instructor or fellow students.” (p. 252)

“learning components such as motivation, content, practice, and feedback should be built into the instructional materials” (p. 252)

“If you begin your development with the instructor included in the instructional process, it is very easy to use the instructor as a crutch to deliver the instruction. In your first effort as a designer, we recommend that you see how much can be done without having an instructor actively involved in the instructional process. Not only does this test your design skills and give you added insight into the learning components of an instructional strategy, but it also gives you a defined and

replicable product to take into the formative evaluation process” (p. 252)

“The analysis and design work serve its purpose by ensuring an instructional product that is responsive to the needs that gave rise to the original goal.” (p. 252)

“In many instructional settings, the person who designs the instruction also develops materials and teaches students. For example, a human resources generalist in a small company may design, develop, and deliver all new-employee orientation, benefits training, and “soft skills” training; teachers and professors do their own lesson plans and syllabi, materials, and instruction; professionals in all fields routinely design, develop, and present their own workshops and in-service training.” (p. 252)

“By providing a learner guide for available materials, instructors may be able to increase the independence of the materials and free themselves to provide additional guidance and consultation for students who need it.” (p. 253)

“In professional and technical training, the designer often develops a formal instructor’s guide that provides detailed lesson plan–like guidance for lectures, discussions, and participant activities, whereas in educational settings, daily lesson plans or the course syllabus serve this purpose.” (p. 253)

“The intended delivery mode for instruction is a very important consideration in the development of materials based on the planned instructional strategy.” (p. 253)

“If instructors plan to deliver all the instruction with such materials as lecture notes, a multimedia projector, and a whiteboard, then it may be necessary to develop little besides lecture outlines, electronic presentations, practice worksheets or active learning exercises, and formal tests.” (p. 253)

“Another commonly practiced arrangement assigns responsibility for design with the instructor, but not sole responsibility for materials production. Unusual in public schools, it occurs more often in higher education, business,

government, and military settings, where there is often technical assistance available for production of complex media such as video, web-based, and multimedia. The designer usually works collaboratively with an in-house media production specialist rather than turning over specifications.” (p. 254)

“Another reason for introducing the idea of an ID team is to point out a common problem in the instructional design process that stems from the relationship, or lack thereof, between the designer and the learners: When the designer is also the instructor of a given set of learners, the designer–instructor has a good understanding of the interests and motivations of the learners, of their preferences and expectations, and their general and specific knowledge of the content area. It is often the case, however, in team ID settings that the designer is not the instructor, is unfamiliar with the learners for whom the instruction is intended, and may have little or no direct contact with them. In such cases, the designer can depend on careful learner and context analyses, but in lieu of good information, he or she may depend on personal stereotypes of what the learners are like. Such assumptions may result in more problems than if the designer had no knowledge of the learners at all.” (p. 255)

“Media formats and delivery systems that look expensive are expensive. Cutting production corners to save money usually does not affect student learning, but it does affect attention and perceptions of relevance and authority.” (p. 256)

“Practitioners of the e-classroom and e-lecture–hall models worked out innovative strategies for maintaining high levels of interaction in their courses without burdening their instructional personnel by shifting their instructor–student communication to student–student communication. This works well for peer-moderated practice and feedback, and for small-group discussion focused on implementation and transfer to the performance context. It also works well when

e-space is set up for small-group project and problem-solving interaction.” (p. 258)

“Some training managers and performance consultants speculate that problems in online learning have arisen when content from instructor-led training was converted for web delivery without in-depth consideration of the learning components for which the instructor had been responsible in the face-to-face learning environment.” (p. 258)

I would argue that what is missing here is also a redesign based upon the change in delivery medium. What makes sense in the classroom may not make sense online.

Chapter 11: Designing and conducting formative evaluations

“Studies have shown that thousands of the instructional products sold in the United States each year have not been evaluated with learners and revised prior to distribution (p. 283-284)

“Other studies have demonstrated that simply trying out materials with a single learner and revising the materials based on that data can make a significant difference in the effectiveness of materials.” (p. 284)

“We typically think about formative evaluation and revision of instructional materials as one major step. For the sake of clarity and to emphasize the importance of reexamining the whole instructional design process when instructional materials are to be revised, we separated the design and conduct of the formative evaluation study from the process of revising the instructional materials.” (p. 284)

“The major concept underlying this chapter is formative evaluation , which is the process designers use to obtain data for revising their instruction to make it more efficient and effective. Its emphasis is on the collection and analysis of data and the revision of the instruction.” (p. 284)

“There are three basic phases of formative evaluation. First, in one-to-one or clinical evaluation, the designer works with individual learners to obtain data to revise the materials. The second stage of formative evaluation is a small-group evaluation . A group of eight to twenty learners representative of the target population study the materials on their own and

are tested to collect the required data. The third stage of formative evaluation is usually a field trial.” (p. 285)

As mentioned above, rarely do we get a chance to do a complete formative evaluation with these three steps. This is an ideal world, not the real one!

“What frame of reference can you use to design the formative evaluation? Keeping in mind the purpose of formative evaluation is to pinpoint specific errors in the materials in order to correct them, the evaluation design—including instruments, procedures, and personnel—must yield information about the location of and the reasons for any problems. Focusing the design only on the goals and objectives of the instruction is too limited. Data on learners’ achievement of goals and objectives is insufficient, although important, because these data only provide information about where errors occur rather than why they occur. Similarly, a shotgun approach to the collection of data is also inappropriate. Although collecting data on everything you can imagine produces a variety of information, it may yield some data that are irrelevant and incomplete.” (p. 285)

“Although the formative evaluation process focuses on the acquisition of data from learners, it is also important to have the instruction reviewed by specialists.” (p. 287)

“Formative evaluation of instructional materials is conducted to determine the effectiveness of the materials and to revise them in areas where they are ineffective. Formative evaluations should be conducted on newly developed materials as well as existing materials that are selected based on the instructional strategy. Evaluations are necessary for both mediated- and instructor-presented materials. The evaluations should be designed to produce data to pinpoint specific areas where the instruction is faulty and to suggest how it should be revised.” (p, 310)

Chapter 13: Designing and conducting summative evaluations

“Summative evaluation is the process of collecting data and information to make decisions about whether the instruction actually works as intended in the performance context; further, it is used to determine whether progress is being made in ameliorating the performance problems that prompted the instructional design and development effort. The main purpose in summative evaluation is to determine whether given instruction meets expectations.” (p. 343)

“Interest in summative evaluation has shifted from comparisons of innovations and statements of posttest performance to demonstrations of learner performance in the performance context where the skills were intended for use. Are the skills used by the learner in the workplace, and do they work? To answer these questions, there are two areas summative evaluation studies typically examine: the qualities of the instruction and the impact of the instruction on the organization. Instructional quality questions are answered using expert judgment reviews of the instructional materials and procedures. Organizational impact questions are answered using studies of skill transfer into the worksite after instruction is completed.” (p. 344)

“Summative evaluations are conducted to make decisions about whether to maintain, adopt, or adapt instruction. The primary evaluator in a summative evaluation is rarely the designer or developer of the instruction; the evaluator is frequently unfamiliar with the materials, the organization requesting the evaluation, or the setting in which the materials

are evaluated. Such evaluators are referred to as external evaluators; these evaluators are preferred for summative evaluations because they have no personal investment in the instruction and are likely to be more objective about the strengths and weaknesses of the instruction.” (p. 364)

“Instructional designers make excellent summative evaluators because of their understanding of the instructional design process, the characteristics of well-designed instruction, and the criteria for evaluating instruction. These skills provide them with the expertise for designing and conducting the expert judgment as well as the impact analysis phases of the summative evaluation.” (p. 364)

This is where you can add appendices or other back matter.