A Case for Microlearning

When I first started creating online learning tutorials about fifteen years ago, we tried to pack everything that we taught in a one-shot class session into one or two tutorials. These tutorials could take anywhere between thirty minutes and an hour to complete. We really had no idea if the tutorials were effective or not, but looking back, the tutorials were aligned with what we knew about how students learned online, which wasn't all that much. Today we know that adult students learn better when presented with shorter bits of information, especially when that content is delivered online.[1] Contrary to popular belief, this is not due to students' shortened attention spans, but rather because it is more aligned with how they consume any type of new information, such as online TED lectures, YouTube videos, or text-based web pages.[2] Shorter bits of learning are also better aligned with andragogical learning theories, which stress the importance of presenting students with information that is immediately applicable and relevant to their coursework and lives. Thus our learners are not telling us, "I am bored and can't concentrate," but rather, "Don't waste my time with information I don't need." Adult learners also want self-paced and self-directed learning. They want to decide what they want to learn, when, and in what order. This is where microlearning comes in.

Although around since the 1960s, microlearning has been growing in popularity over the past ten years or so. Today, it is being used a lot more in corporate training and is starting to become more popular in higher education, including in academic libraries and in information literacy instruction. There really is no set definition of microlearning. I have seen a lot of definitions in the literature, but I think this definition attributed to Hug and Friesen in a report on microlearning from Grovo captures what microlearning is: "Microlearning is generally characterized by low time commitment, small chunks, short effort, and narrow topics, but it is complex as a whole."[3] With this definition in mind, let's consider an example. Most zoos have an informational sign that offers some information about the animal, its habitat, its diet, and so on next to each animal exhibit. Are these signs an example of microlearning? It certainly meets some of the criteria—low time commitment, small chunks of information, doesn't take a lot of effort to access or complete, and introduces only a few narrow topics, but is it complex as a whole? The answer is no because microlearning is more than just a snippet of text.

A microlearning activity should consist of an entire lesson: content, guided learning, practice, and feedback or reflection. It should also be easy to access and learn. Students should not come across barriers in order to access the content, so they should already be familiar with the delivery mechanism or it should be easily accessible and navigable. This is in contrast to a macrolearning course like one offered via a course management system where students may need to learn how to use several different parts of the system before they can get started with the content. Microlearning is intended to be remembered immediately, as it is just a small bit of information and is intended to have immediate application. Macrolearning may be forgotten, as it may not be used for months down the road. Microlearning can consist of individual parts to cover more topics, but those individual parts must be independent of each other. In contrast, macrolearning often uses textbooks with chapters and content that build upon each other. Finally, there is no consensus among educators as to just how short a microlearning lesson should be, but under ten minutes should be a rule. Others advocate for less time and have found that, independent of content, students began to lose interest in videos after six minutes.[4]

The benefits of microlearning include both better engagement and better learning. Most of us dread mandatory e-learning trainings for two major reasons: they tend to be boring and too long. Students approach online tutorials, especially those that they are not

required to take, in the same way: dread and boredom. Students often do not have the time to complete a long tutorial, but they do have the time to complete a tutorial that takes less than ten minutes. All types of online learning courses and tutorials that are not mandatory have notoriously low completion rates.[5] Reich found that for MOOCs, across subject matter, between 2 and 10 percent of learners complete a course.[6] One reason why is the sheer amount of time it takes to complete such a course. Microlearning courses, however, have been found to have 75 to 100 percent completion rates.[7] Since microlearning tutorials address only a few outcomes and are quick to complete, students can easily access the tutorial again if they need to. There is also a lower cognitive load; working memory can hold only a certain amount of information, and we forget about 70 percent of what we learn within twenty-four hours.[8] Shorter means learners have less information to retain and later recall. Shorter also means greater motivation. Our learners are busy. They see a short tutorial that will take them about five minutes and they think, "OK, I can do that." A long tutorial will have the opposite reaction. Finally, short tutorials are also easier to create and later edit, so this can save us time and resources.

Of course microlearning is not for everyone nor for all subjects. It can be fragmented, and we want our students to gain a lot more than just a few skills here and there. Information literacy skills are long-term goals that need revisiting, reinforcement, and repeated application, and these skills need to build on one another, so microlearning is not ideal for teaching complex concepts. Thus, while microlearning will work if the goal is to teach conversational Spanish, it might not work all that well for teaching Spanish literature. In terms of information literacy skills, microlearning works well when teaching discrete skills, like creating search strategies, but won't work so well with concepts such as critical information literacy.

Designing Microlearning Tutorials

Backward Design

Often when designing a learning activity, we start with the content and lay out how we are going to teach it—that is, this concept will come first, then we will work on this, followed by this topic. Then we may design some activities for learners to do and end with how we may assess students' learning. This process leads to a flat learning experience that is content-focused and not student-focused. Backward, as the name suggests, starts at the end. It starts with learning goals and thinking about what you would like your students to be able to do after completing a tutorial or other learning intervention. I like to start my tutorial design by writing three types of goals: cognitive, behavioral,

and affective. I am interested not only in what my learners should know but also in what they should be able to do and how their feelings or attitudes might change. For example, a tutorial on evaluating online resources may have the following goals:

After completing the tutorial students will

- explain what lateral reading is
- evaluate an online source for credibility
- feel confident in their ability to judge a source for credibility

The next step in backward design is to create an assessment that can measure these outcomes. Only then should a tutorial be designed for content, sequencing, and activities. A backward design approach also helps with creating more engaging tutorials because it forces you to put the content on the back burner and the learner's experience first.

The ABCs of Outcomes

There are three words (there are probably more, but these will suffice) you should never use when writing learning outcomes: *know, learn, understand*. Why? Because learning outcomes should be specific, observable, and measurable. Although you could write specific learning outcomes with any of these words (something along the lines of "Learners will know how to request a book via the library's loan service."), it is not possible to observe or measure what learners *know* or what they have *learned*. Immediately after writing an outcome, you should have a good idea of how you could measure the extent to which the learner achieved that outcome. Let's take this same outcome but write it with an action verb: "Learners will explain the steps in requesting a book via the library's loan system." Here, the assessment almost writes itself: the student will list the steps needed to complete a book request using the library's interlibrary loan system. There are thousands of online resources that list action verbs aligned to Bloom's taxonomy.

Outcomes are a first step to creating any type of lesson or tutorial, and just about any course in teaching will point out the importance of learning outcomes and making sure learners are aware of them. Letting students know what the learning outcomes are ahead of an instructional session has a myriad of benefits, including an increase in engagement and motivation, more focused attention, more self-directed learning, and quicker mastery of skills.[9] However, learning outcomes should never be listed at the beginning of any microlearning tutorial. Most teachers don't stand up in front of a class and read aloud each learning outcome they wrote for that day's lesson. This would be a very effective way of boring students. However, almost

Table 2.1. Sample tutorial instructions

Original Directions	Revised Directions
dataZoa has many helpful features including custom charts. You will probably need to customize your chart with different types of labels. Customizing your chart is not difficult, but it will take a few steps to learn. Let's learn how to customize the chart you have created. You can change the labels for the chart data.	**Customizing Your Chart** Let's learn how to customize the chart you created. **Your Turn**
Go to the Series Settings tab in the chart window. Choose the "Real Personal Consumption Expenditures: Education" series from the Which Series drop-down menu.	• In the **Series Settings** tab, choose "Real Personal Consumption Expenditures: Education" from the **Which Series** drop-down menu.
Look for the Label box toward the middle of the screen. Change it to "Education." Click outside the Label box, and you'll see that the legend under the table shows the blue line is now just "Education."	• Change the **Label** box toward the middle of the screen to **Education**. • Change the **Which Series** drop-down menu to "Real personal consumption expenditures: Clothing, footwear, and related services."
Change the Which Series drop-down menu to "Real personal consumption expenditures: Clothing, footwear, and related services" data (the red line), and change the Label to "Clothing, footwear, and related services."	• Change the **Label** to "Clothing, footwear, and related services."

all information literacy tutorials I have come across start with a long set of learning outcomes. Learning outcomes, especially when designing microlearning tutorials, are for us as teachers and designers, not for our students. We have a very limited amount of time with students, and we don't want to waste that time with a list of outcomes that are often ignored. Yes, we must orient our students to the learning, but this can be done via descriptive titles, section or chapter headings, or one sentence that is part of the narration. Again, this is more aligned with how students learn today. Many YouTube video tutorials start with, "Hi, today we are going to learn about . . ." and not a list of outcomes.

Cutting Out the Fluff

A microlearning tutorial should include only essential information, which means cutting out the fluff. The fluff is anything that is not directly aligned to the learning outcome. Some of the most popular videos on YouTube are how-to tutorials. Usually these tutorials start off with an introduction to the channel, the YouTuber, a request for a Like, and an introduction to what we are going to learn that day. This usually takes up over half the video, and more often than not, the viewer fast-forwards through it and ignores it. If we need to figure out how to use a new feature on our phone, we do not need to know how much a particular phone cost, where it was purchased, when it was purchased, how long the person has had it, and so on. Cutting out the fluff means eliminating all this extra information that might be good to know but is not needed to achieve the learning outcome.

Limiting Text

As an instructional designer for our library, I often create tutorials based on content developed by librarians,

and the first thing I do each time is cut and rewrite text. Librarians, in their quest to be as helpful as possible, often write unnecessarily complicated and long text passages, and this goes against how users consume digital text. I have come across several studies that show that users rarely spend all that much time reading text on a screen. One study by the Nielsen Norman Group found that users read anywhere from 20 to 28 percent of the words on a screen.[10] Knowing this and knowing we have a limited amount of time with our learners, we need to cut out any text that is not directly related to our learning outcomes, and we want to make our text easier to skim and scan. The easiest way to do this is to use headings, bold lettering, and bullet points. Table 2.1 shows two examples of a set of directions that was created for a tutorial. In the example on the right, I eliminated any unnecessary text, added a heading, broke up text into chunks, and added bold letters and bullets. In the revised example, a learner can easily skim and scan the page and follow the directions more easily.

Comprehension Checks

Remember, an effective microlearning tutorial is not simply a video. Rather, it is an entire lesson with an assessment component. Comprehension checks throughout a tutorial allow the user to receive immediate feedback on their progress. Multiple-choice and reflection items are two common and easy ways to allow students to check their comprehension and receive feedback. In my book on creating online information literacy courses, I include several guidelines for writing effective multiple-choice items that can be easily aligned to different levels of Bloom's taxonomy.[11] Among the most important of these are creating effective prompts that don't confuse the student and writing distractors that are plausible and challenging for the student in order to truly gauge student

learning. Before writing a multiple-choice question, I strongly suggest taking a look at these easy-to-follow guidelines. Often used to check simple recall, multiple-choice items can also be used to test higher-order thinking skills such as analyzing and evaluating. For example, in a tutorial on using sources, a common question may be to ask learners to recall the definition of plagiarism. A higher-order thinking skill question would have students read a short passage followed by some rewrites of that passage and an analysis of which may be plagiarized.

Reflection questions build engagement and motivation by allowing students to assess their own learning, understand themselves better as learners, and come up with solutions on their own.[12] As with multiple-choice items, reflection questions can be used throughout a tutorial, including before learning begins to help activate learners' prior knowledge. Reflection questions should be concise and address one specific learning outcome. They should also be based on the learner's experience, and they should challenge the learner so that they need to pause and think about the question. To use at the beginning of a tutorial, write questions that ask students to recall and reflect on a time when they used a similar set of skills as those that are about to be taught. For summative reflection questions, I like to have students reflect on what they feel was the most important thing they learned and why, or I have them reflect on three things they learned. Most e-learning tools allow you to give answer-level feedback, and this feedback should be meaningful. Meaningful feedback means a thorough explanation of why a particular answer was incorrect. Students should be allowed and encouraged to try answering a question again if they get it wrong. Feedback should also have a friendly tone. Instead of using "correct" or "incorrect," we often use "oops," "not quite," or "almost." Reflection questions should also include feedback, even if the feedback is a canned reply or something along the lines of "Thanks for your answer."

Notes

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