

One-Size Orientation Fits All? Our Brain Doesn't Say So!

A 2018 White Paper by

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brighter learning.

Table of Contents

Introduction	1
Engagement	4
Efficiency	6
Authenticity	8
Guidelines for Implementing Luma’s E2A Instructional Model	9
Engagement	9
Efficiency	12
Authenticity	15
References	19

Introduction

Training is an ever-important topic in the truck-driver industry. Not only is there a push to find effective safety training that actually *changes* driver behavior, but also, the industry's extremely high driver turnover underscores the importance of producing an efficient and successful orientation program.

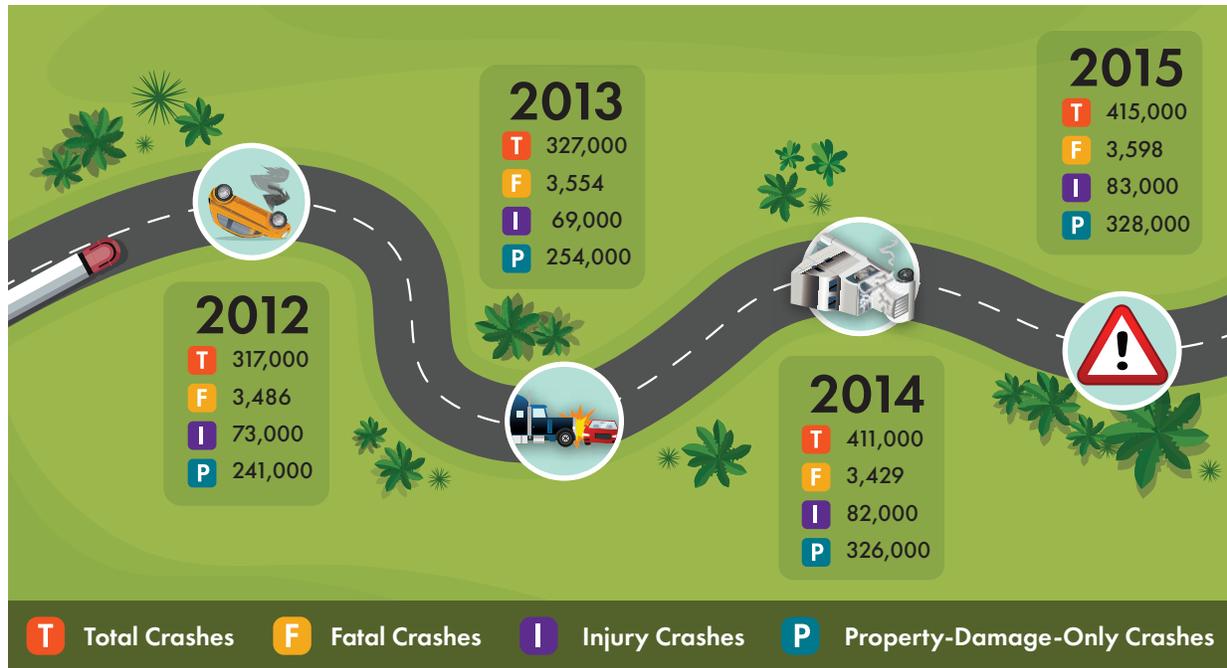
The American Trucking Association reports an industry-wide driver turnover of 88% (American Trucking Association, 2018). Orientation training has become a revolving door, where trainers regularly conduct orientation trainings over, and over, and over. This repetition can become tedious, making it difficult to bring interest and excitement to the program.

Moreover, the pressures to cover important orientation and safety information quickly and, in many cases, across multiple locations bring to question whether all drivers are being adequately prepared. Adding to the complexity of training is that some drivers bring experience to their new positions, while others are brand new to the industry.

Crash statistics reported by the National Highway Traffic Safety Administration (NHTSA), over a period of four years, illustrate the seriousness of working commercial drivers who do not adequately employ the safety principles that they're supposed to be learning.

With such a high demand for experienced drivers and the added pressures to “just fill the seat”, these statistics are bound to get worse unless drivers are properly trained.

Crash Statistics of Large Trucks



The U.S. Department of Transportation NHTSA’s National Center for Statistics and Analysis (2018) reported that, “In 2016, there was a total of 34,439 fatal crashes in the United States involving 51,914 drivers. As a result of those fatal crashes, 37,461 people were killed” (p. 1).

In this white paper, we introduce a new instructional model, called the **E2A Instructional Model**, that is based on and proven from our work with many different industries over the past 20 years and on our peer-reviewed research in the learning field. We first describe each component of the model, and then outline a practitioner’s guide on how to use the model successfully in your driver orientation or training program.

Background



Learning is....”a persisting change in performance or performance potential that results from experience and interaction with the world” (Driscoll, 2005, p. 1).

So, how do we help drivers not only retain training content, but also employ those concepts when they are needed? The topic of how people learn best is heavily debated in the learning science and instructional design fields. Luma “Brighter Learning” was built to deliver measurably better education outcomes. Luma has been in education field for over 20 years and has been helping drivers learn for the past five. We continually conduct research on drivers’ learning preferences so we can provide the best possible learning experience for them. Luma’s products DRIVE SAFE, DRIVE FIT, and DRIVE FIRST are all grounded in learning science. Through our research, we have seen that drivers have a wide array of different learning needs. Further, carriers often have different training demands. As a result, we use our knowledge of how drivers are learning and work with carriers to customize their learning programs to best meet the needs of their drivers.

Over the past five years, we have received **30,684** instances of unsolicited feedback from drivers regarding our learning content and have used that feedback to identify key attributes to improve driver learning. We have given out over **135,000** digital badges and over **230,000,000** leaderboard points. The average rating across all of our driver training modules is **4.38/5.0**.

Based on this data and our prior work within the driver industry, Luma introduces the **E2A Instructional Model**. E2A employs three principles of learning that we have found are critical to driver learning: engagement, efficiency, and authenticity. This paper describes each of these principles separately. We then discuss how we employ them in driver trainings.

Engagement

Engagement: Learning is promoted when drivers are attentive and motivated to learn (Merrill, 2012).



The Process of Learning: Do I have your **attention**?

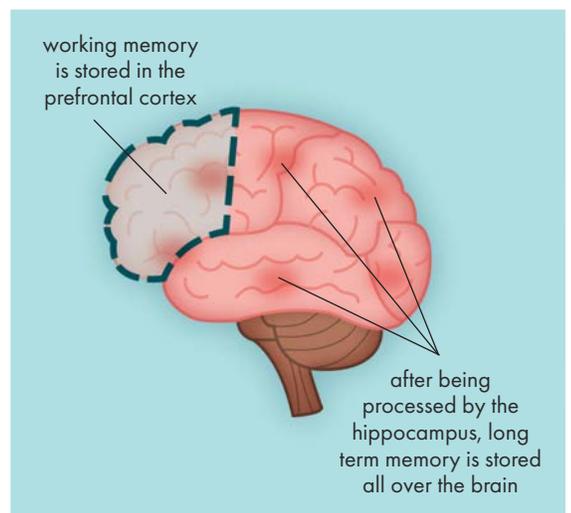
There is a psychological process for learning (e.g., Clark, Nguyen, & Sweller, 2006). The first step: **Get the driver's attention.**

You can gain **attention** through visual or auditory information. Gaining attention is a critical step for learning. Without having someone's attention in the first place, how will they begin to learn? A lot of driver training is presented by a classroom teacher or a video. If your drivers are not engaged within the first 30 seconds (or less), you may lose their focus and attention. This is consistent with analytic research that find that attention spans when watching video, in general, are decreasing to about 30 seconds (Groupman, 2016; Lopatecki, Rose, Hughes, & Wilson, 2017). It is worth noting that an abundance of driver training to date primarily consist of longer videos (even up to an hour per training).

What is important in learning is to help keep the learner's mind from wandering and/or being distracted from outside or unrelated information (Robison & Unsworth, 2015). If there is a lot of unnecessary internal or external distraction or information presented to drivers, it may bog down their **working memory** and overwhelm or underwhelm them.



audio and visual attention

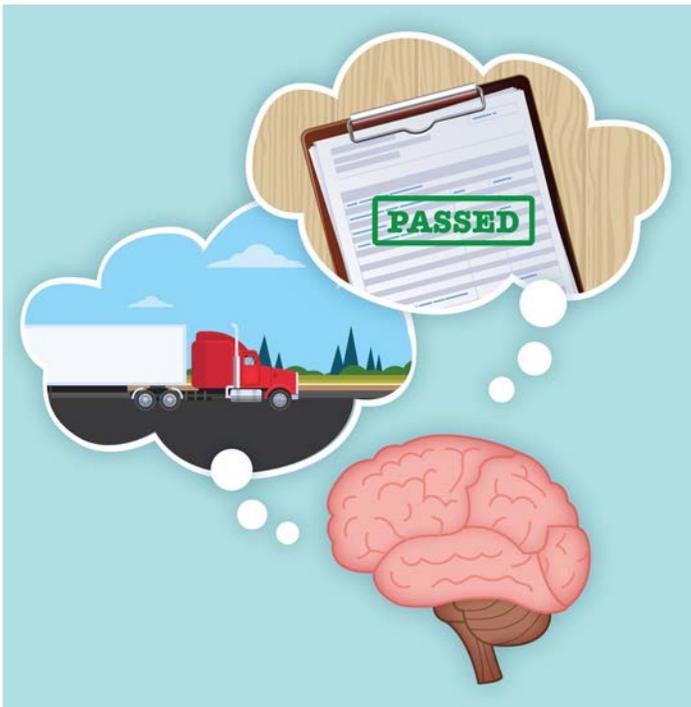


working memory

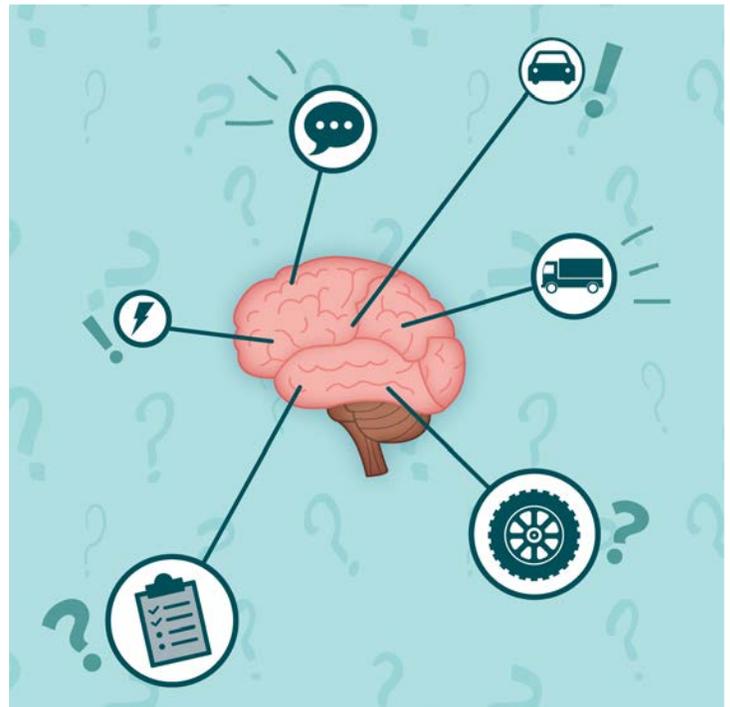
The connection between motivation, attention, and learning have been discussed for centuries (Driscoll, 2005). Will the driver continue to engage because they are **intrinsically** motivated (where the topic is relevant and interesting to them), and they want to learn more? Or maybe they continue to engage because they are **extrinsically** motivated and they have to finish because it is mandatory for the job, or maybe they earn points or rewards for completing the training.

Miller's law states that the average adult may only be able to hold 7 ± 2 pieces of information in their working memory (Miller, 1956). This means that even if they are attending and motivated, their brain might put a halt on the learning because it is simply "full". Once the brain is overloaded in their working memory (which those in the learning field refer to as **cognitive overload**), they most likely will not be able to take in more information, ultimately preventing them from making cognitive connections for long term memory.

The good news is that instruction can be designed to support the cognitive process of learning (Clark, Nguyen, & Sweller, 2006).



intrinsic and extrinsic motivations



cognitive overload

Efficiency

The second E in Luma's **E2A Instructional Model** deals with efficiency.

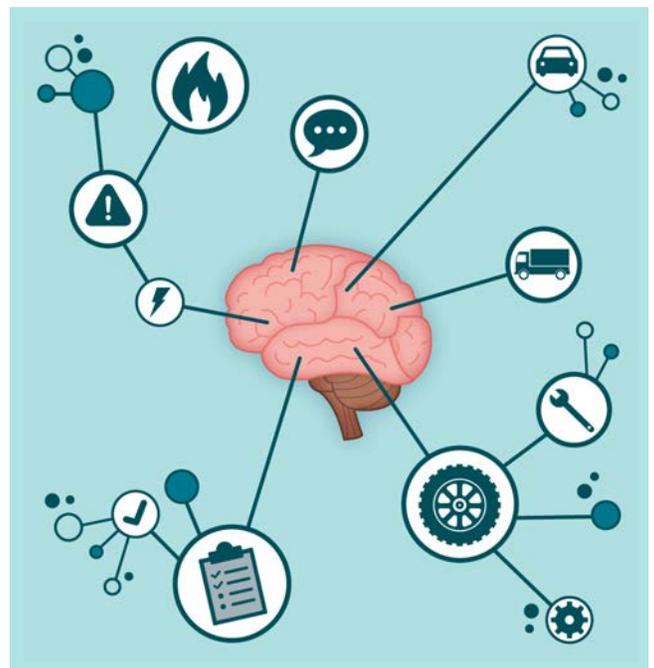
Efficiency: Learning is promoted when you create a learning environment that is aware of the limits of human cognitive capacity (Clark, Nguyen, and Sweller, 2006).



How much information do you present to your drivers in one given classroom session? If we have to engage drivers and we know that their working memory can only take in a certain amount of information (and all drivers' cognitive capacities will differ), what can be done to make the learning experience more efficient? Our guidelines in the section on page 12 will provide some practical tips for making orientation more efficient. First, however, it is important to understand what we mean by efficiency in the context of the learning process.

The Process of Learning Continues: Activation of Prior Knowledge... Elaboration—Rehearsal, Oh my!

Cognitive load theorists explore the limits and strengths of cognitive human processing (Sweller, 2011). Think of efficiency as creating opportunities for drivers to have the best chance of retaining information. We all strive to make sense of the information we bring in through our senses. The key is to recognize that there are limits of working memory that impact what we will retain in our long-term memory. By presenting a lot of information in a compressed time frame, we may strain a driver's working memory and reduce the chance that the driver will recall the information when it really matters.



schemas

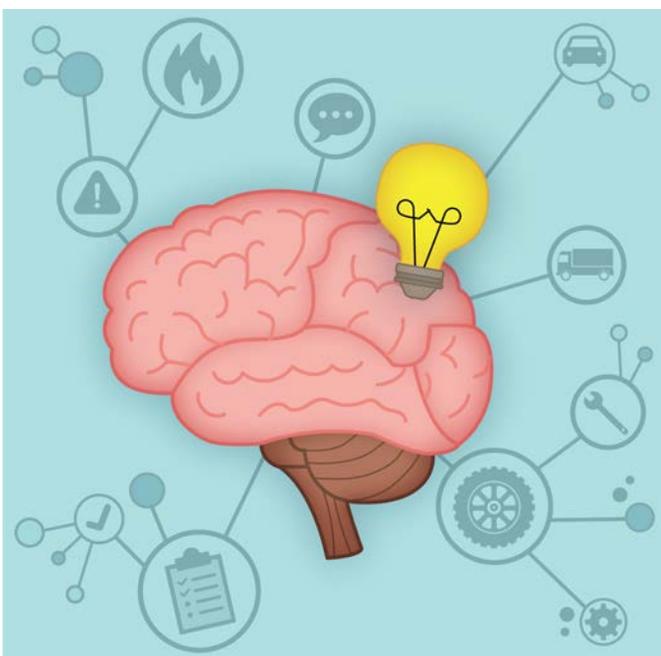
Think about a situation where you were presented information on a topic that you knew something about or some topic that really interested you. Did you think back to something that you already knew and could relate it to? “Oh, yeah this reminds me of when....”

What your brain is doing is making connections between the incoming information to prior knowledge or experiences. What is occurring cognitively is that your brain is making connections of these concepts to existing structures (or what cognitive learning theorists refer to as **schemas**) in our brain (Clark, Nguyen, & Sweller, 2006). It is like our brain saying, “Ah ha! I recognize something like this,” and we relate it to what we already know. If it is new information that we have never seen before, our brain might say, “Wait, I am confused. I need more time or information!”

Some drivers may not be able to take on new information. It is like the brain saying, “Yikes.. we are moving on and I just don’t get it!...please hold on...” In a classroom setting, you may continue to move forward presenting information because you only have a certain amount of time to relay this information or, with videos, the content is presented the same to all learners at the same pace. At this point, some drivers may need more time to get more information on the topic. Or maybe English is not their first language. They have to process not only the information but the language that is not their native language they learn in. The

driver may need more time to elaborate or take in the new content. In fact, they may need to practice, see the information in a different way, hear the content in their own language, etc. The elaboration and rehearsal stages of learning take on different forms for different drivers and require different approaches to learning.

The end goal of the learning process is to have drivers retain and retrieve the information later. We want the information to be stored or encoded in their **long term memory** so it can be recalled and applied at anytime, anywhere.



long term memory

Authenticity

The A in Luma's **E2A Instructional Model** is all about building authenticity.

Authenticity: Learning is promoted when you make it relevant to the learners (Jonassen, 1999).



The author and other researchers have discussed the variability between designers' intentions of what they believe to be relevant or meaningful to the learners when developing instruction and training materials, compared to what the actual learners' report to be authentic to them (e.g., Anderson, 2015; Gulikers, Bastiaens, & Martens, 2005; Herrington, Oliver, & Reeves, 2003). Others have argued that authenticity cannot be predetermined (Anderson, 2015; Petraglia, 1998). However, we all know that current training for drivers are delivered to them with little or no input. How do we know that what we are providing to drivers is relevant and meaningful to them to help them learn?

The learning research over the past decades has discussed the importance of examining authenticity through the exploration of the learner, the activities, and their environment (Barab, Squire, & Dueber, 2000; Herrington & Oliver, 2000). Luma's work in different industries has supported this research. It appears that no two trainings we deliver are exactly the same. This is true across the driver industry: The drivers have different needs, and different carriers have different cultures and resources that impact their needs. The trainings and materials are even different from other industries, like nursing.

Training needs to have the flexibility to offer different types of learning materials and formats to drivers. This is supported in the literature that learning environments and content have to be differentiated because learners have different learning backgrounds, abilities, and learning needs (Tomlinson, 2014).

Guidelines for Implementing Luma's E2A Instructional Model

We want you to have some practical guidelines that you can implement with your own orientation and trainings. Under each instructional pillar (Engagement, Efficiency, and Authenticity), we provide some practical tips you can implement with your drivers that are grounded in our research of drivers. We have had over **18,000** drivers through our trainings, and **79%** return when there is no mandate for them to complete the training (**58%** return four or more times) . This is because drivers report they like the trainings. *Engagement* is the first step in learning.

Engagement

Engagement: Learning is promoted when drivers are attentive and motivated to learn (Merrill, 2012).



We have found that, since its release, 30% of drivers have used the virtual agent reader at some point in the trainings. Nearly everyone has elected to view the content in English.

Ascertain Driver's Learning Preferences

Ask yourself, when are you the most motivated to learn? Would you be more motivated to learn if the training was aligned to how you learned best? We find that most people design materials in the way they learn best or in the medium they know how to produce materials, instead of asking their learners how they would learn best.

Our research shows that the medium or type of delivery of driver training depends on the objective of the training. For example, a driver learning how to back a tractor trailer might prefer to read step-by-step instructions in his or her language on how to do it and then practice, while another driver may want to watch a video of someone backing a trailer. However, if a driver already knows how to back but they are needing a refresher, they may prefer to read tips that are boiled down to the most essential information presented in a way that is clear and in their native language.

Our backing materials are rated on a Likert Scale 1–5 (5 being the best and 1 being the worst), drivers (n=394) the average score is 4.6. One example comment from a driver: “I like these better than the videos. Easier to read something for yourself and see the answers. Than have it read to you and miss something.” We are constantly monitoring drivers and their preferences so we can change the content to make it clear, easy, and in the medium that they report they learn best.



The key is to ask your drivers how they learn best. We have found the type of medium (e.g., animations, video, text, audio) may change depending on the goal or objective of the training and the delivery (online versus face-to-face).

Keep Content Entertaining and “Fun”

How can we make learning “fun”? Drivers rate the content that have animations, look game-like, and is interactive (where they can click and drag-and-drop) the highest. You can also implement rewards and leaderboards. Make training “like-a game.” When drivers are engaged they often report that they learn something new. Using the backing content example, one driver said, “I’ve been driving for 13 years and I’m still learning new things every day! I think once you don’t learn anything or become a know it all I think it’s time to hang up driving and look for a new career!!” another driver said, ““I love these. I’ve learned so much and I’ve been a Professional driver for over 20 years.” Our training looks and feels like a game.

We study what type of formats elicit positive feedback for specific types of training and offer content in that format. We also analyze which content they visit the most and ask

them what they like and what content they would like to learn more about (see more about that in the Authenticity section). We then make modifications to parts of the training that drivers report to be confusing or that simply are rated lower than others. Because we strive to understand what the drivers prefer, we can use what we learn to help keep the drivers engaged. As one driver put it, “You guys hit it right on. Good work. Useful informative and not so boring that I wanted to fall asleep.”

It is important to remember that just because drivers are required to complete orientation and training, they may still not be motivated to learn. Consider embedding external motivators, like rewards and leaderboards. Some drivers in our system are motivated by the gaming features. This is evidenced by the support tickets we receive asking for more training (so they can earn more points). One driver left a comment, “...give me the points!” and another, “I love seeing how I stack up.” Drivers in the Luma system can earn points in a variety of ways for engaging in the training. We can make participating like a game, where they can earn points for leaving comments, rating the content, and/or answering assessments correctly. The end result of the point-collection is that drivers can see how well they stack up with their peers, and carriers can then provide rewards like company t-shirts and hats. We can set up custom badges or certificates, or we can coordinate with our partner, StayMetrics, to allow drivers to trade in points for merchandise.

If you set up your training like a game, it is important to set up the rules for the game up front. You have to define the game and the rules of the game. How do the drivers win? We say the real win is to see the results of drivers engaging in training with reduced incidents on the road!



The key is to offer a variety of content formats and track what drivers access and report favorably. Consider how you can incorporate game-like features into orientation training. Make learning fun!

Efficiency

Efficiency: Learning is promoted when you create a learning environment that is aware of the limits of human cognitive capacity (Clark, Nguyen, and Sweller, 2006).



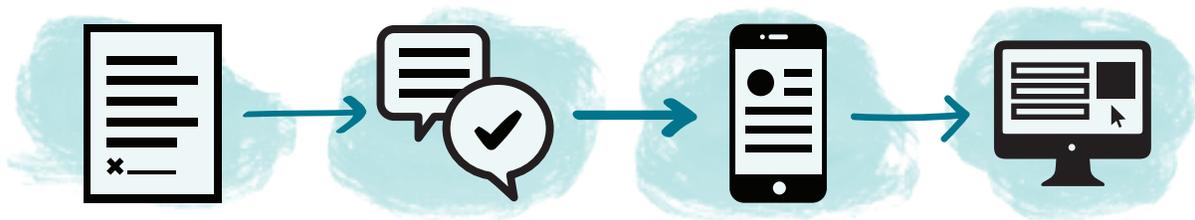
Create Shorter Sessions for Learning

There are many strategies you can use to create shorter “sessions” for learning. The word sessions is in quotes because it could be interpreted to mean a variety of things. We are defining sessions as breaking down **delivery** and **content** into more manageable pieces for processing.

Delivery

We have seen orientation that is impactful where all learning does not have to take place in a classroom at one given time. Think of opportunities for learning when drivers are out on the road or exploring content through a mobile device (before or after class).

It is important to keep in mind that learning does not necessarily need to happen at a specific time and a specific place. It can be ongoing. This is important to consider because some drivers need more time to process and think about the content. Also, drivers come to the orientation and training with different prior knowledge. Here is an example of a way that we have helped carriers redesign their delivery:



Drivers complete forms and basic training before they come to class. Free up class (if they come to a physical class) for the important information.

Drivers come to class ready to engage in shorter presentations and discussions.

Drivers leave class with an online tool that provides the opportunity for review and helps reinforce the concepts they have learned.

Assignments can be made for drivers who need the extra reinforcement.

Content

Do you deliver most of your content auditorily or through video? Do drivers have to sit and listen for long periods on end? Does the driver control the pace or is it controlled by an instructor or video? These are all factors to consider regarding learning efficiency. We have learned that content should be broken down into smaller pieces where drivers can control the pace. You can break down large topic areas into smaller topics and break down those topics into smaller sections for learning. We created eNuggets® to help with this process online, but you can create the same type of content efficiencies at your organization. For example, you can do this by providing some time where drivers are listening to a speaker, other times where they are discussing in groups, and other times where they are working through content that is broken down into more measurable pieces online.



The key takeaway is to look at ways to make delivery and content more efficient. Break content down and provide a variety of delivery formats to support the learning of all drivers.

Make the Learning Environment Accessible and Easy to Use

Accessibility is important when considering efficiency for learning. This is true in the physical classroom as well as the online classroom. The CEO at Luma has worked with individuals with special needs and places an emphasis on making the learning environment accessible to the needs of all learners.

How do we know their needs? Unless you study the drivers' needs and habits or ask them, it is difficult to determine what they need. If you are using an online tool, ask the drivers if it is easy to use. Ask drivers what would make it better. The environment you learn in is as important for learning as the delivery and content. We ask our drivers these questions and they can leave anonymous feedback, so we can make constant improvements to our online learning platform. One driver that completed Exercising on the Road eNugget® said, "This form of online training is very helpful and easy to complete and I must say very rewarding." Another completing the Exercising with Limited Equipment eNugget® said, "This is great learning tool!" An example of a suggestion was, "Question one is very misleading. Yes

avoid backing if all possible. But you will never avoid all backing.” We invite this feedback so we can make their learning better!



The key takeaway is that it is difficult to understand what someone needs unless you ask them. Ask your drivers what would make their learning experience better. The environment you learn in is as important for learning as the delivery and content.

Activate Prior Knowledge

If you have the opportunity to determine what the drivers know before you train them, you should consider doing this. Why? Some drivers may have 20 plus years of experience, while others may be brand new. Like any adult learner, drivers want to engage in content that is relevant to them. However, in this career, you have laws, regulations, and policies that you have to make sure everyone understands. By assessing their prior knowledge, you can see what they already know, what they still need to learn, and provide the training that each driver needs. This helps save valuable training time for you and the driver. Some strategies for activating prior knowledge are:



Online only training

Give drivers an online pre-test to see what content they know and still need to learn. Drivers can briefly review, bypass, or engage in content that interests them and engage more deeply in the content they need to learn more about.



Online and classroom training

Give drivers an online pre-test to see what content they know before they come to class. Have different groups engaging in different content based on the results of the pre-test. Free up class time for topics that need more review or explanation.



Classroom only training

If you do not have an online learning platform, you can distribute the survey in paper when they come to class.



The key takeaway is activating can help save training time and reduce the cognitive load on drivers. It can also make training more relevant and interesting to drivers because you are focusing the training on what they do not already know.

Build Opportunities to Practice and to Review

Assessment not only provides information on what drivers know and do not know, but it can be used to reinforce learning. You can also provide driving opportunities with mentors or simulations or animations that they can practice in a safe environment. Drivers in our system comment that multiple select questions (true/false, multiple choice, survey, multiple select, etc.) help them learn. One driver who completed the Nighttime Driving eNugget® said, “This is an awesome awareness test. I had some knowledge of these, however, this shed some more light for me while driving at night.” Another driver who completed the same topic said, “I really like this training course. The questions have me on edge. Love it!” As one driver who completed the Backing eNugget® put it, “These questions will keep your mind sharp.”



The key takeaway is that assessments can be used to reinforce and review important topics.

Authenticity

Authenticity: Learning is promoted when you make it relevant to the learners (Jonassen, 1999).



Conduct Ongoing Monitoring of Learning

How do you make learning relevant to the learners? Ask them! Sure, there may be one or two drivers who have really unique perspectives or needs, but over time, you start to see trends in what your drivers prefer and get information about what they would like to learn. This is helpful in making content relevant to your drivers and you often find that what one driver asks for, another also finds helpful. For example, one driver who completed our Human Trafficking eNugget® said, “I was surprised to see a lesson involving this topic. But it was very helpful

and educational.” Another who completed our Avoiding Lane Change Crashes eNugget®: “Been a driver for 35 years however this is really great training and opened my eyes. Thanks.” Here are some ways you can monitor the learning of your drivers:



Implement Surveys

We implement online survey questions as part of our ongoing training. We find that some drivers (as well as all adults) do not want you to know their learning challenges. Providing opportunities for anonymous feedback lets drivers tell you what they need without feeling embarrassed or pressured.



Use Feedback Loops

Think of feedback loops as an ongoing cycle of monitoring. You get ongoing feedback frequently and often so you can make informed and ongoing improvement. For example, ask drivers during class what they like and don't like, but you don't do this once at the end. You can do it day-by-day or during different learning “sessions.” You can use instant polls or automatic rating systems. We do this online by including ratings at the bottom of each eNugget®. Drivers can leave any type of feedback that they want. This should not be done just one time. This is ongoing. Preferences change depending on content and goals of the learning session.



Use Learning Platforms with Analytics

We know that sometimes what a driver reports might not align with what they are using or need. For example, we asked drivers through survey questions if they liked audio only eNuggets®. When we first started developing content, we assumed drivers would want to listen to the content. Forty-three percent of users say they want a combination of content. However, we found some drivers asking us for audio because they could not read. We built in our system the flexibility to have content read to them. They can turn it on if and when they need it. Our analytics inform us as to how many drivers use these features and how often they use them.



The key takeaway is you can use tools such as surveys, feedback loops, and analytics to get ideas on what your drivers find relevant and interesting.

Differentiate the Format, Learning Mediums, and Tools

Through our surveys, feedback loops, and analytics, we are able to determine what types of content drivers find relevant and interesting, but we can also find out what drivers use and find relevant to their learning. We can also determine what carriers feel is relevant for their own organizations and drivers. We have found that there is not one “out-of-the-box” solution that works for everyone. Carriers have different needs just as drivers have different needs. These are the main areas that we found need to be differentiated:



Differentiate the Format

Consider all the different ways you could offer and deliver content (online, face-to-face, and a combination). Online opportunities allow drivers to go back and review content at their own pace. We find that drivers return to the orientation content for refreshers and access to policies and procedures that they forget after the classroom session.



Differentiate the Learning Mediums

Do not assume the way you learn is the way the drivers learn. Do not assume the status quo of video is okay. Based on our research, drivers prefer to have a variety of types of mediums.



Differentiate the Learning Tools

We have found the learning tools for one carrier may not be the same tools needed for another carrier. For example, one carrier needed content offered in multiple languages, while another has drivers who need readers. We can work with carriers to customize their learning environments. We then can look at the analytics to see what tools the drivers actually use. In one instance, for the carrier that asked us for the reader, 13.5% of their drivers are utilizing the optional read, but they are all using English. However, in another carrier’s Collection, they had a few drivers (3.7%) who had the site translated to them in Spanish, but they did not use the reader.



The key takeaway is to differentiate the types of learning formats, medium, and tools.

The **E2A Instructional Model** provides three learning principles that you can start using today to improve your driver training. As drivers bring to the table many different learning preferences, our goal as trainers becomes to make content match those preferences so that it becomes relevant to them. When learning is more relevant, drivers show a willingness to engage in it. This results in changes in behavior. As one driver who completed Exercising with Limited Equipment eNugget® put it, "Great program wife says I'm looking better and I'm feeling better."

Let Luma help you build a custom orientation or driver training that incorporates the elements of their **E2A Instructional Model**.

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