

# WHY MICROLEARNING MATTERS

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How to leverage cognitive science insights to deliver training content that sticks.

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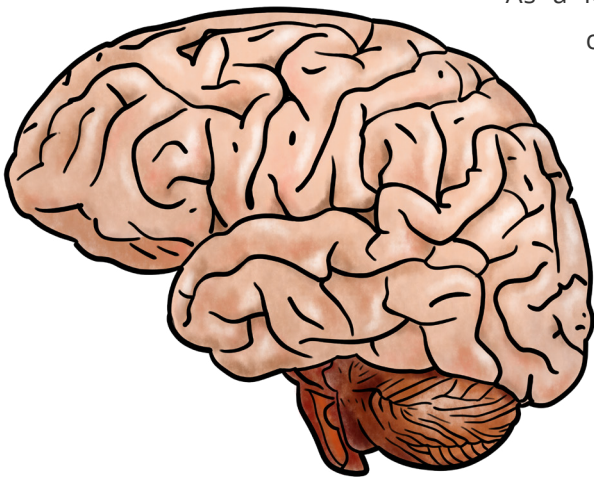
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## 1

# Introduction

The modern world has shifted. We're lucky to stay 4 years in a job, let alone 40. There's more data than ever, more to learn than ever, and the half-life of learned skills is shorter than ever. And, of course, we have so little time. To keep up, we need to learn.

And, of course, there's the elephant in the office: automation. Robots coming to make us redundant. However, fearing automation means you don't value human skills. Automation allows us to offload the tasks we're not needed for, leaving us free to use our most powerful tool: our minds. The modern workforce doesn't need the mindless and menial. It needs thinkers, ahead of the game, continuously improving.



As a learning company, at Yarno, we're interested in the circumstances that influence the implementation and success of learning. As such, the aim of this report is to address the issues weighing on the mind of the modern learning professional, and from there, present a solution to these issues. To do this, this report will first outline the current landscape of the modern workforce, its problems, and then detail the efficacy of microlearning as a tool to remedy these problems.

Microlearning is a buzzword on the tip of every

Learning & Development professional's tongue. And for good reason; the ability to up-skill and embed positive behaviours in just a few minutes a day is not just desirable, but necessary, to the modern workforce. However, like all other buzzwords, to be effective, microlearning requires more than just sprinkling it in your day-to-day without further thought or consideration.

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## Methodology

This report was compiled over a six month period. We began by interviewing notable figures within the Learning and Development and Human Resources fields. These interviews focused on uncovering what problems those in the industry are experiencing, and how best to remedy those problems.

Re-occurring themes that emerged from these interviews:

- The challenge of training a distributed workforce
- Lack of time for employees to complete training
- ROI from training: how do we know that what has been taught, works?

We found that these challenges aligned with the challenges our customers at Yarno had

experienced.

To address these challenges, we utilised the existing body of cognitive science research to evaluate how, according to already completed research, humans learn best.

Finally, we put theory into practice by conducting our own case studies, which you can find an overview of at the end of this report.

Before continuing, we'd like to say thank you to everyone who agreed to talk to us. Your time and insights are invaluable. This learning company has learned a lot from you, this report was written by you, too.



## 2 The landscape of the modern workforce

Right now, the landscape of the modern workforce is a crucible, and bubbling to the top is the need for microlearning. There are three main elements at play here:

1. Shift to remote work due to COVID-19.
2. High skill-shortages.
3. Lack of time.



If we take a look at the effect of these circumstances on the workforce landscape, we'll see that microlearning rises to the top as a way not just to solve these problems, but to better our workforce in almost every way.

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## The shift to remote work and high skill shortages means that businesses need to shift to a remote learning model.

Everything changed in 2020. Working from home is now a necessity, not a perk. The traditional training model of getting everybody in one room together is no longer an option (and may even result in some serious fines and/or your business being responsible for an outbreak). So we're forced to adapt, to overcome.

On top of this, we have a general skill-shortage. The rate of technological improvement means that what you learned at school is outdated faster than ever. In fact, according to Deloitte, 54% of employees will require significant up-skilling or re-skilling in the next three-years (Deloitte Insights 2019, p. 81).

The effect of these two circumstances is that modern businesses need to find ways to up-skill and engage their employees remotely.

While this may seem limiting, it's also an opportunity: businesses may not need to hire the perfect fit. Rather, they can hire someone who will become the perfect fit. When afforded opportunity for growth and professional development, re-skilling an employee may take up to a year, but it can be done for as little as

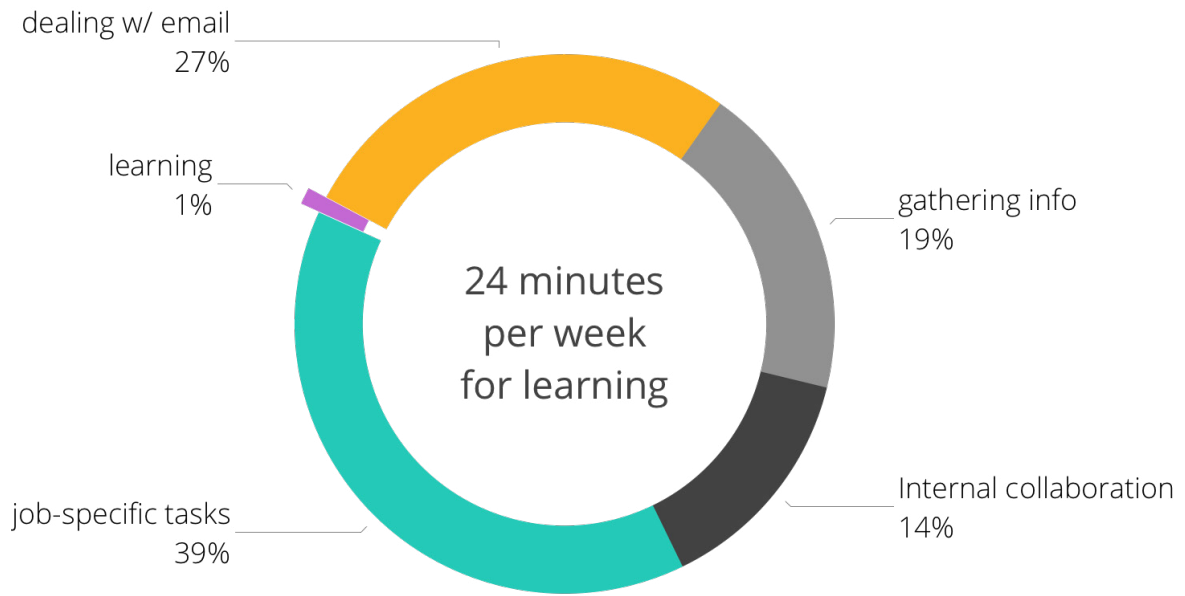
1/6th of the cost of hiring an external candidate (Deloitte Insights 2019, p. 74).

Further, remote learning will continue to be a business advantage even when all restrictions are done away with, due to the significant cost reduction compared to in-person training. When training is remote, you don't have to pay for flights, accommodation, or even suspend work activities. Training is done just-in-time, right when you need it.

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## News to no-one: the modern learner is time-poor

The average modern worker has just **24 minutes a week** (1% of their time) available for learning (Bersin 2017, p. 37).



This adds an extra difficulty to the workforce landscape: we know that we have to significantly invest in re-skilling and up-skilling our employees, but the problem is finding the time to do it!

The above checklist is important. You should carry it in your mind whenever evaluating a potential learning solution.

But that's ok, now we know what we need. So far, our examination of the modern workforce shows that we need a solution to these problems, and that solution must:

- Be able to significantly up-skill and re-skill employees.
- Be able to up-skill employees at the pace of technological change.
- Be able to do all of the above in just 24-minutes a week.

# 3

## The microlearning solution

### What is microlearning?

Simply put, microlearning is pretty reflective of its namesake — little bits of learning. Small chunks of knowledge, delivered at the most crucial points in the learning process.

Microlearning is done in a few minutes a day, usually no more than 10, and is most-often delivered to your phone or tablet. Basically, microlearning is a catch-all word for any sort of learning done in short doses. It could be a short video, a quiz, or even just a google search. Anytime you learn something in micro-doses, you're micro-learning.

In this way, microlearning most definitely meets one of our requirements: it's quick enough to be done in 24-minutes a week. So we're a third of the way there, however, the next question is:





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## Is microlearning effective?

In other words: is microlearning enough? A few minutes a day doesn't seem like much, and it's not. A common problem that people run into with microlearning is assuming that microlearning is simply presenting the entirety of the content you need to learn in bite-sized chunks.

To be effective, microlearning requires much more than that. Sure, you might remember a little more from a 60 minute video if you watched 10 minutes of it at a time. Except much like cutting a cake into 50 tiny pieces and thinking it's going to be better for you, you've still eaten a whole cake.

Rather, microlearning should be leveraged with cognitive science insights. That is, we should present microlearning in ways which, according to science, we learn best.

Below, we've rounded up some of the most important insights that should be used in conjunction with microlearning.

### Insight #1: Just the need-to-know points

You can't know everything, there's simply too much to know. 4 petabytes (1 petabyte = 1,000,000,000,000,000 bytes) of data are

created every day. Adding to that, 90% of data in the world has been generated in the past two years (Marr 2018, para 1). The rate of human knowledge is accelerating at an unfathomable, un-comprehensible rate. To expect us to know everything, to expect us to even know everything within a specific field, is completely unachievable.

Which is why, rather than trying to know everything, we need to separate the wheat from the chaff. The job of instructional design isn't to provide an encyclopaedic inventory of everything to do with a particular topic, but to effectively teach the need-to-know points within a particular topic.

We've all been guilty of highlighting every line of a textbook. While easy, this method is pretty ineffective. Trying to learn everything is passive; it's rote. Distilling everything down to the key points is a much more active and efficient exercise.

### Insight #2: Spaced repetition

Simply put, spaced repetition is presenting the same content at spaced intervals. It also goes by the name "revision". The need for spaced repetition is innate: we all know that cramming doesn't lead to long-term retention. You might pass the test the next day, but the information quickly falls out of your head. Quickly forgotten, hardly remembered.

However, the forgetting phenomenon is

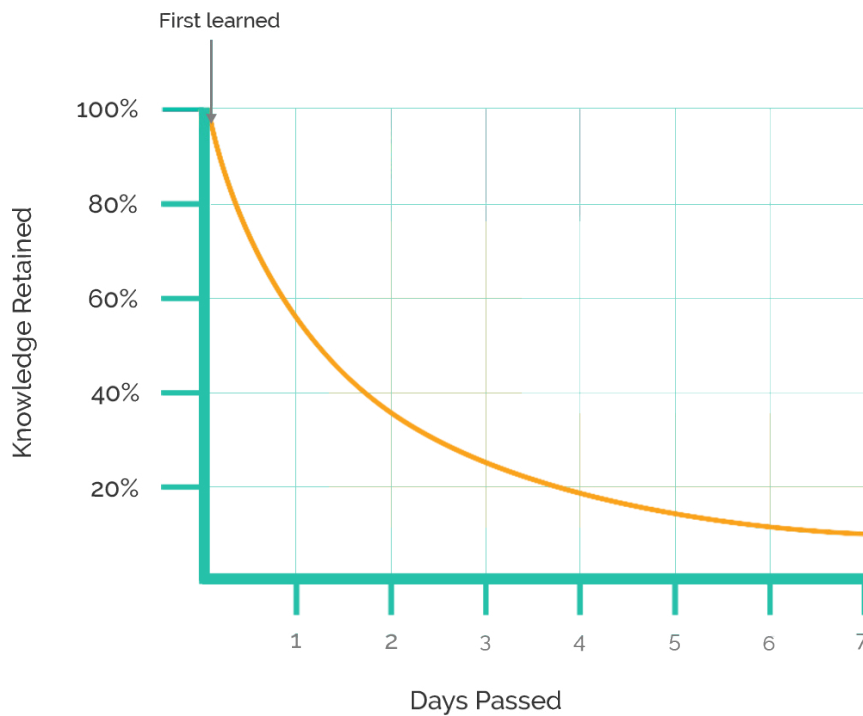
scientifically backed and was plotted on a curve way back in 1885, by a man called [Hermann Ebbinghaus](#).

Ebbinghaus was a German psychologist who conducted a series of experiments where he would write down a bunch of random syllables like this:

**XBH, AOJ, APK, AJI, AOI**

He would then repeat them to himself until he had them completely memorised. Once he had them down pat, he would attempt to recall that series of syllables at periodic intervals; after a day, after two, then a week, a month, even six weeks after first learning them. After each attempt to recall them, he recorded exactly how many of the syllables he could summon in the correct order, and plotted them on a graph (Woodworth 1909). That graph looked something like this:

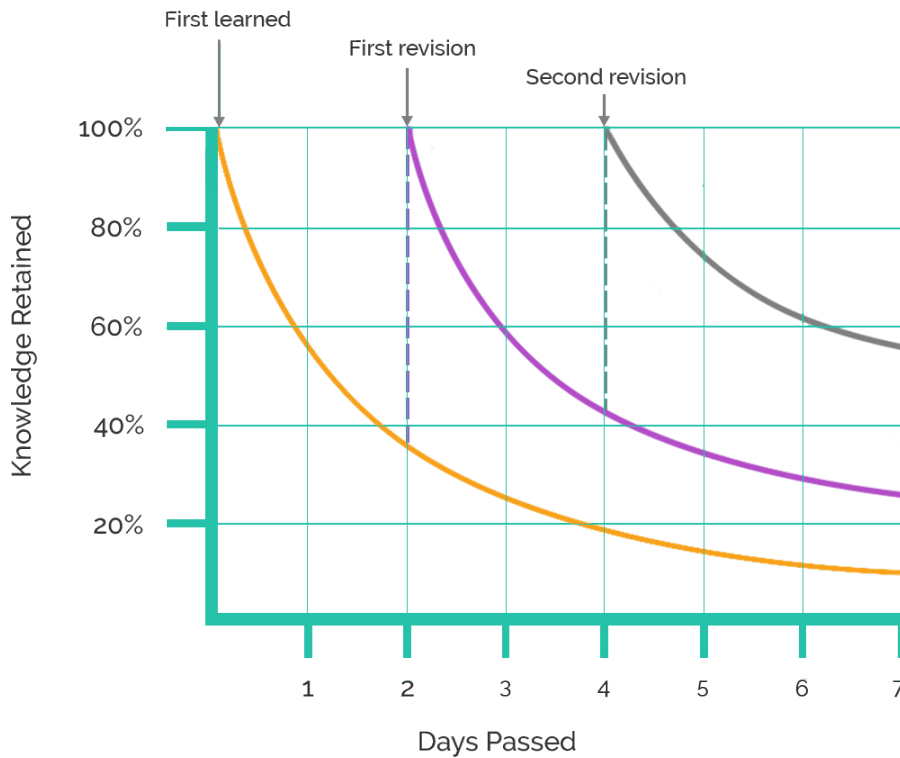
## The Forgetting Curve



His findings definitively determined what we already know: our brains are leaky buckets. If, at the time of first learning something you know 100% of that content, a day later you'll only know about 50% of that same content. That percentage gets less and less until soon enough, you remember hardly anything at all.

However, Ebbinghaus also proved another thing we already know: the way to counteract this is through revision. If you revise something a day, a week, even a month after you first learn it, it strengthens the memory in your mind, and makes the forgetting curve much more gradual. It starts looking more like this:

### Effect of Spaced Repetition



Which is where spaced repetition's interaction with microlearning comes in: once you've distilled everything down to what you really need to know, you can re-present that information overtime to reinforce and embed the knowledge.

The reason why a lot of us don't revise isn't because we don't want to learn, but because we simply don't have the time to go through mountains of content once, let alone two or three times. But this is exactly why microlearning and spaced repetition work so well together; you can go through something several times if it only takes you a few minutes each go.

## Insight #3: Micro-assessments

There are two kinds of multi-choice quiz: the useless kind, and the useful kind. Useless is the kind comprising a 150 question exam where you get a final score at the end and that's it. No follow up, no feedback on where you went right or wrong.

However, the humble multi-choice quiz becomes useful when used to improve memory, rather than strictly as an assessment.

Quizzes can:

- Encourage repetition of learning concepts
- Present learners and instructors with immediate feedback
- Highlight common misunderstandings

Studies show that students who have been quizzed have a double advantage: a more accurate idea of what they do and don't know and improved memory as a result of having to

regularly recall knowledge (Butler and Roediger 2008, p. 605).

Micro-assessments can be used at any time throughout the training cycle, whether that's pre, during or post training interventions.

- **Pre:** Questions can be used to surface common misconceptions before training starts. This can assist the trainer in focusing attention on specific areas for improvement.
- **During:** Questions can be used to check knowledge and understanding of just-learned concepts throughout the training. This can provide a useful indication to the instructor as to how well learners are receiving what's being taught.
- **Post:** Questions can be used to reinforce learning concepts over time, providing retrieval practice and feedback.

As such, micro-assessments can be used in conjunction with spaced repetition, so as to obtain the benefit of the actual knowledge solidifying in the mind of the learner, while also having the added benefit of learning what you *don't* know. From there, you know what areas you need to work on, so you can answer correctly next time.

## Insight #3: Micro-assessments

Most of the time, we learn sequentially. We work through the entirety of a topic before moving on to the next. Textbooks are a great example of this, presenting one chapter at a time with a quiz at the end (if you're lucky). This approach is called blocking, and it's very useful for cramming and recalling the next day.

Blocking isn't always the most effective way to learn, however, as it doesn't require us to know the difference between learning concepts, just what order to use them in. Because of this, there's not that much critical thinking involved, as the brain moves steadily from one topic to another.

A great way to stir the brain up a bit, and force it into critical thinking is through interleaving. Interleaving is when many different, but related, learning concepts are presented to us at the same time.

When concepts are interleaved, each solution is different from the last, so answering questions by means of rote memory doesn't work. Rather, critical thinking is required as the brain must constantly search for unique answers and solutions, a process that improves the ability to learn critical features of skills and concepts to then select the best response.

This method feels much harder at first, as our brain struggles to make sense of how all the different topics relate to one another.

However, over time as we begin to square it all in our mind, interleaving reaps greater rewards (Benassi, Overson and Hakala 2014, p. 136). The struggle was worth it; the knowledge sticks for much longer as we had to consolidate it in our mind, before storing it away.

[More on interleaving.](#)

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## Putting it all together: the microlearning recipe

Successful learning requires consideration. Microlearning is a buzzword, not a saviour. While it can be a very effective learning technique, it is only effective when created and curated carefully. It's not enough to chop up your textbook into bite-sized pieces. To truly reap rewards, and meet the needs of the modern workforce, your learning solution should:

- 1. Distill everything into just the need-to-know points:** Extract what is critical to know, and deliver that.
- 2. Be repeated:** One-and-done is not enough. To truly embed knowledge, we need to revise it over time.
- 3. Provide immediate feedback:** Micro-assessments provide constant feedback,

so you can know what you don't know.

- 4. Utilise Interleaving:** Presenting different-but-related topics at one time forces your brain to work harder, and actually understand what it's learning.

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## Microlearning drawbacks

There is no one complete learning solution. While, as discussed, microlearning is powerful, and is arguably a necessity for modern training, there are inevitably a few cases where microlearning isn't the one-stop solution. Below I've outlined few of these (with strategies to bridge the gap!)

### Drawback #1: It's not suitable for complex problems or learning an entirely new skill

Bite-sized learning modules realistically aren't the best choice for complicated tasks, skills, or processes that call for a specific structure or particularly, physical practice. Microlearning experiences are "micro" because they allow for quick, effective reinforcement of knowledge and concepts. This means they're not ideally suited for deeply involved subject matter that require heavy creative or lateral thinking.

That's not to say the method strictly isn't

applicable! A few ways to incorporate microlearning into a larger course or syllabus:

- **Before the course:** to gauge current knowledge levels
- **Throughout the course:** to take advantage of spaced practice
- **After the course:** to reinforce and strengthen learning over time.

### Drawback #2: Sometimes material becomes fragmented

It's important to consider that learning experiences that use microlearning should be holistic and comprehensive. Covering only one aspect of the topic or not giving enough attention to others can make the broader topic seem fragmented or disjointed. Ideally, each activity within the learning experience should be connected in some way, yet still provide learners with the key information they need to know.

To prevent fragmentation, clear, actionable learning objectives should be defined before any content is written. That way, every piece of content can be centred around those objectives, creating a cohesive learning experience. Allowing learners to see the big picture is key to making sure they've got a well-rounded knowledge of the topics.

## Drawback #3: Creating great content takes time and effort

This sounds like a no-brainer. However, it's easy to fall into the trap of "It's only a few (short videos, multiple choice questions, explanations) it'll be an easy job". Truth is, effective microlearning content is the **hardest to create**. Distilling information into need-to-know chunks that are actually useful is truly an art form.

### Further reading:

How to create effective multiple choice questions: <https://yarno.com.au/blog/common-multiple-choice-mistakes/>

# 4

## Q&A with Joel Smith, Instructional Designer

Instructional design is the process of designing instruction; the instructional designer is the person who designs any sort of training or learning material. From your Year 12 syllabus to your company's LMS, the instructional designer is the person behind the material.

Joel Smith is the Head of Instructional Design at [Yarno](#), so we spoke to him to grab a few thoughts on best practices for modern workplace instructional design, and where microlearning fits in.



**Q:** Where should the instructional design process start?

**A:** Define the word should!

I believe that the instructional design process should begin at the end, with what you ultimately want to affect. And for me, what I want to affect is always behaviour. All problems (and solutions) come down to how people



behave. So as often as you can, you should start by examining what you want people to do – or don't do – and then work backward to the content that will guide them to the thinking and choices that will elicit that behaviour.

**Q:** What is the purpose of instructional design?

**A:** I believe the purpose of instructional design is to facilitate minds toward critical thinking and critical decision making that will contribute to a team's shared success.

**Q:** What is your number 1 rule when designing learning activities?

**A:** Rule number 1 is to consider the goal from the perspective of the learner. What will motivate them to put their precious time, attention and energy into engaging with it? What's their motivation, inspiration and frustration? Why should this matter to them? Understanding your learner will tailor what you create to their perspective, and increase the chance they'll care about it.

**Q:** Where do people often go wrong when creating training?

**A:** I think the most common mistake is thinking every learner needs to memorise everything about a given topic. This results in the info-dump 100-slide power points that most workers know, where every possible thing they may or may not need to know is listed in bullet points. It usually follows on from the leader that called for the training reacting emotionally to a problem and prescribing not just that training needs to be done, but how it needs to be done and in what time frame.

The truth is that most information these days can be referenced in some sort of database, and only a sliver of that information needs to live in long-term memory of individual learners. And in fact, a lot of the time, training is not the solution to their problem at all!

**Q:** Is microlearning a complete solution for all training needs?

**A:** The workplace would love a silver bullet for all training needs. But people are complex, and learning is a journey, not a reaction. Microlearning has been a revolution to the training industry, not because it's poised to replace all other solutions, but because it

helps complete one specific part of the learning journey – repetition.

Implementing microlearning in isolation will not deliver celebratory results. But when it's integrated into a holistic training environment that considers and provides all the provisions for a learning journey, it can act as the linking multiplier that amplifies the transformative effect of all the components together.



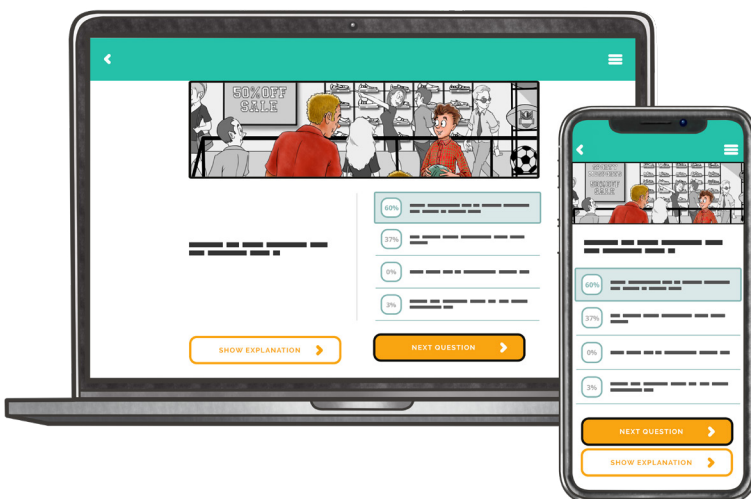
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## Microlearning case studies

Research and arguments are all well and good, but they're nothing without proof. To truly test whether microlearning is an effective learning solution for the modern age, we need to examine the results of companies that have actually implemented microlearning.

### Method

While this report was compiled over a six-month period, the body of work it builds on began much earlier than that. The following case studies are comprised of real-world results off the back of Yarno campaigns. Yarno is microlearning software designed to embed need-to-know information and stimulate critical thinking in the workplace.



It does this through daily quizzes targeted towards specific challenges a particular company is facing. The training takes place over a 6-8 week period, for just 3-minutes a day. The technology builds upon all the insights we have discussed, with the ultimate goal being positive behaviour change and knowledge retention. More information on [Yarno microlearning software](#).

Before each Yarno campaign, we created, with the customer in question, detailed learning objectives, by which the efficacy of the software and microlearning in general could be evaluated. Overall, the aim was to discover whether 3-minutes of learning activity a day was sufficient to embed knowledge and produce positive behaviours among learners.



### Summary of results:

3 minutes of microlearning a day has been consistently proven across 3 different industries (transport and logistics, retail and radio sales) to embed knowledge and elicit desired behaviours among staff-members who have completed the training. These businesses in turn benefitted from an increase in revenue due to:



- **Transport:** Improved safety behaviour resulting in fewer costly incidents overall.
- **Retail:** Improved customer service and sales expertise leading to an increase in sales and NPS ratings.
- **Radio sales:** A reduction in time to productivity (the time it takes for a new hire to positively contribute to monthly revenue targets), thereby increasing profitability overall.



## Supercheap Auto



**COMPANY:**

Supercheap Auto

**INDUSTRY:**

Retail

### Challenges:

Supercheap Auto ("SCA") implemented a Yarno "Car Care and Repair" campaign in 2019. This campaign aimed to improve the technical knowledge of SCA sales assistants, with the aim that such knowledge would translate to higher NPS ratings, and overall sales.

### Results:

- Yarno lifted Supercheap's Net Promoter Score (NPS) score 9 points in just 6 weeks.
- 47% of stores exceeded their sales targets for the period.
- The NPS score in the Paint & Panel category is now at its highest ever.
- The business saw an increase in like-for-like sales for products trained via Yarno in their last campaign in the Safety Aisle.
- Achieved 7 weeks of continued sales growth at the end of Yarno's campaign.



## Grant Broadcasters



**COMPANY:**

Grant Broadcasters

**INDUSTRY:**

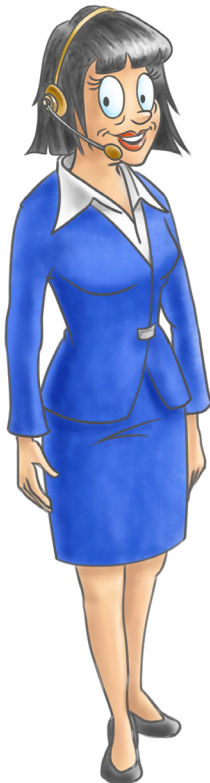
Radio sales

### Challenges:

A Yarno structured onboarding program was introduced for all new hires. This program allows the same information to be presented to all new hires, regardless of where they're located. Onboarding campaigns are launched to familiarise all new hires with Grant Broadcasters' processes and sales techniques. Ultimately, this is done in the aim of reducing time to productivity, thereby increasing profitability overall.

### Results:

- New Account Managers hit their numbers quicker with the Yarno structured onboarding program, compared to those who didn't go through the onboarding program. This reduced new account managers' time to productivity (which is the time it takes for a new hire to positively contribute to monthly revenue targets).
- This had a roll-on effect in that it reduced attrition of new account managers, as they were acquainted with all processes, and aware of their responsibilities much faster than they would be without the program. This reduced attrition is a major cost-saver for Grant Broadcasters as replacing each account manager who leaves is a significant cost to the company.
- 72% of learners gave us a 9 or 10 (out of 10) when asked how likely they are to recommend the Yarno platform to a friend.



## Petroleum Carrier

**COMPANY:**

Petroleum Carrier

**INDUSTRY:**

Transport and Logistics

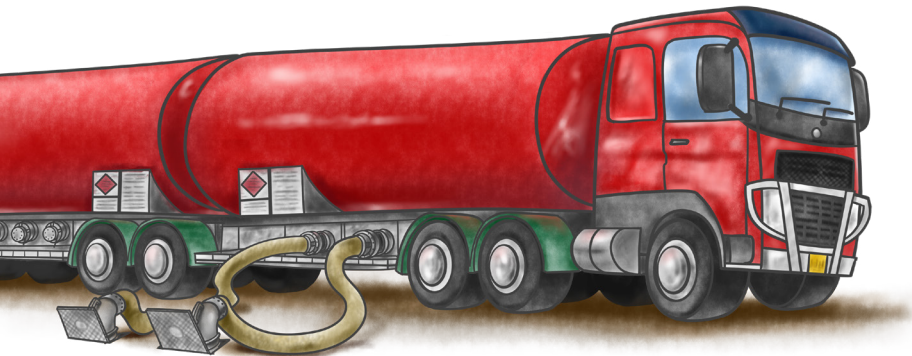
### Challenges:

In January 2019, a petroleum carrier implemented a Yarno 'crossover' campaign. A "crossover" is where the wrong fuel is put into the wrong tank, for example, accidentally putting unleaded fuel into a diesel engine. The crossover campaign aimed to reduce the number of crossovers, as they cost an average of \$5/L, meaning that due to the size of the carrier's petrol tankers, up to \$2 million dollars is at risk at any one time.

Simultaneously, the petroleum carrier also implemented a Chain of Responsibility ("CoR") campaign, which covered the rights and obligations of drivers under national CoR legislation. Like the legislation, this campaign aimed to improve driver-safety habits and ultimately reduce on-road incidents.

### Results:

- 100% reduction in crossovers the following quarter after the microlearning software was introduced. In other words: 0 crossovers post-campaign.
- 76% decrease in on-road incidents the following quarter.

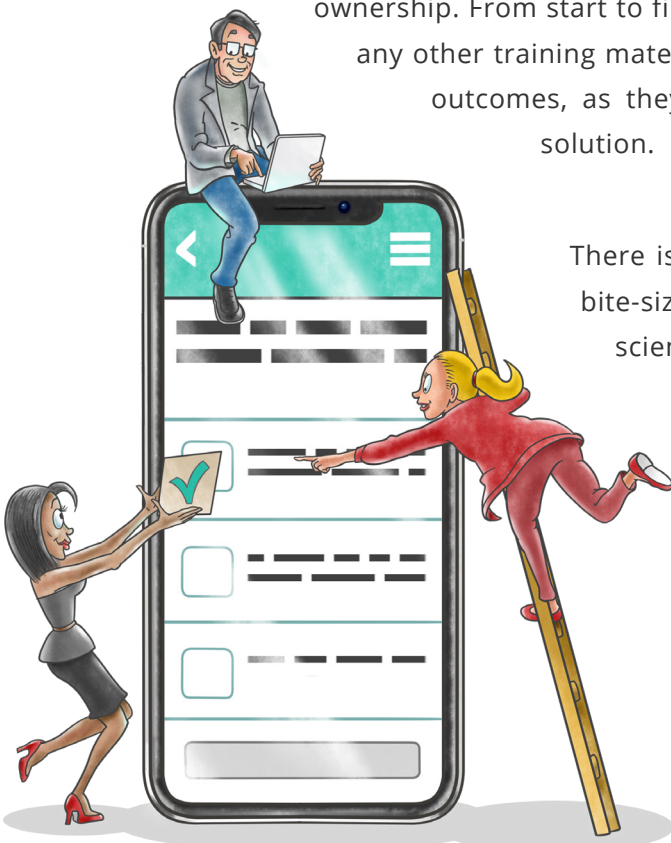


# 6 Conclusion

Microlearning is the medium, not the means. Effectiveness of microlearning, and any training or learning activity, comes from working backwards. From what problems are being experienced, to solutions, and finally to what medium will most effectively impart knowledge and elicit positive behaviour.

Microlearning is undoubtedly an effective medium. However, it will fail if consideration and care is not given to its implementation. Success requires ownership. From start to finish, the implementation of microlearning, and any other training material, requires someone to own the process and outcomes, as they earnestly strive to implement a considered solution.

There is no quick fix in our fast world. A sprinkling of bite-sized knowledge nuggets won't do. Consider the science, the desired outcome, and of course, what we're all here to serve: the people.





## 7

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