PROMOTING LEARNING RETENTION AND NUDGING BEHAVIOR CHANGE THROUGH LEARNING DESIGN PRACTICES FOR WHO ONLINE PLATFORM

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ABSTRACT

This article aims to present learning strategies that can be applied to OpenWHO online courses to primarily increase learning retention and nudge behavior change where applicable. This paper draws on existing research on learning strategies and takes an innovative approach to recommend how these strategies could be applied to learning design to support online learners. Thus, by examining recent cognitive science literature, this critical reflection paper presents approaches to design effective online courses that improve learning retention or nudge changes in behavior where necessary.

INTRODUCTION

Launched in 2017, OpenWHO is the World Health Organization's (WHO) interactive, web-based knowledge-transfer platform offering online courses to improve global response to health emergencies. Accessible through any connected device, OpenWHO offers learners a fast, free way to obtain up-to-date scientific and operational know-how and allows WHO's key partners to transfer life-saving knowledge to large numbers of frontline responders. As of March 2022, more than 6.4 million total course enrollments have been registered on the platform across 140 total course topics translated into 63 languages. In order to increase the effectiveness of OpenWHO courses, WHO aims to bring course design and development further in line with modern learning science and best practices.

The goal of this article is to present learning strategies that can be applied to OpenWHO online courses to primarily increase learning retention, and nudge behavior change where applicable. Indeed, while the previous decades have seen considerable advances in learning science and methods for designing learning activities that improve learning retention, learning science is often misunderstood by both educators and learners alike, and much of what seems intuitively correct about learning is often misguided and ineffective (Bjork et al., 2013).

This article provides evidence-based recommendations with a focus on multiple instructional strategies and learning techniques, i.e., retrieval practice, spaced learning, self-testing, and self-explanation, and elaborative interrogation for developing high-impact learning content. Generally, while recommendations do not instruct educators

and learning professionals how to create activities that overcome passive learning, this article highlights concrete practical recommendations to increase cognitive engagement, thereby promoting learning retention and behavioral change.

In this article, the term "activities" refers to the large collection of instructional or learning tasks from which OpenWHO team or subject-matter experts (SMEs) can choose for learners to do on their own at their own pace and time. The term "spaced learning" is used to refer to distributed practice or spaced repetition as an approach to retention where learners practice at intervals instead of all at once (i.e., cramming) (Roediger & Karpicke, 2006a). We use the term "retrieval practice" to refer to an approach to retention where learners attempt to remember what they learned immediately or sometime after receiving the information. Retrieval practice involves cognitive effort through which the act of recalling facilitates memory consolidation and reinforces knowledge retention in long-term memory (Fiorella et.al., 2020). The term "self-testing" is used to refer to a learning technique that learners use to recall information without referring to learning content by asking themselves questions (Karpicke et.al., 2009). We use the term "self-explanation" to refer to having students explain to themselves information on learning materials as a learning technique (Chi, 2000). The term "elaborative interrogation" refers to a higher-order questioning strategy that employs "why" and "how" questions and then finding answers to these same questions.

The following section summarizes learning strategies and how they can be utilized to improve learning retention of courses on the OpenWHO platform.

UTILIZING LEARNING STRATEGIES AS RETRIEVAL PRACTICE

All learning strategies (i.e., spaced learning, self-testing, self-explanation, and elaborative interrogation) and retrieval practices are mutually supportive of each other and providing retrieval exercises in a spaced manner through a variety of activities can greatly improve learning outcomes. With proper planning and a systematic approach to learning design, each of the following learning strategies can be included in online courses to increase learners' learning retention and, in some cases, promote behavioral change.

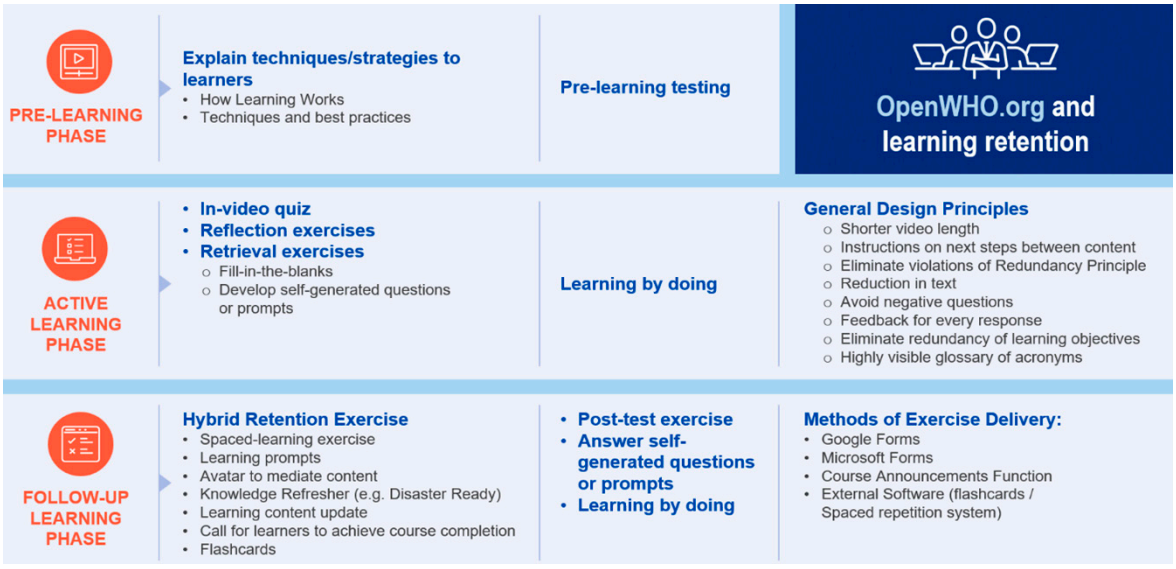
In terms of retrieval practice, there are a variety of activities that can be used after presenting information to the learner to strengthen later recall of this same material, and such activities that constitute retrieval practice provided to learners after this initial learning can take several forms. Figure 1 illustrates all the proposed learning strategies for inclusion on the OpenWHO platform.

Below are types of activities that can be integrated in the learning design of online courses:

Testing

To facilitate active recall of information that helps learners process information in their working

Figure 1. Proposed Learning Strategies, OpenWHO Platform



memory, online activities such as testing using multiple-choice questions, multiple answers, matching, ranking, and open-ended questions can be included after presenting new information. Such questions should aim to drill into this previous learning to check for understanding.

Further, to guide learners to practice self-testing, instructions to craft a question based on the content covered can be included after information is first presented. Research shows that self-testing works more efficiently than the additional study of materials and enhances later retention (Roediger & Karpicke, 2006a; Roediger & Karpicke, 2006b). Although learners' responses cannot be monitored or assessed due to limited technology or presence of instructors in OpenWHO courses, explaining the effects of this exercise to learners would help instill its value as it helps them to identify gaps in their learning (Roediger & Karpicke, 2006b). Another form of self-testing is using self-generated questions or prompts where a learner records the particular material they are having trouble with by formulating a question to themselves that they will answer later.

A simple, yet highly effective, way to increase learning impact is to increase the use of low-stakes testing throughout the learning experience. By increasing the number of tests after, and ideally during (through in-video quizzes), the learning process is enhanced in two ways:

1. Low-stakes testing makes use of what is known as the "testing effect," which is the increase to retention that learners experience while striving to remember what they have learned. Encouraging learners to try to remember before looking up an answer or guessing can be a powerful tool for retention (Bae et.al, 2019).
2. Low-stakes testing changes the learner's perception around tests in general, realigning the perception of testing from solely a way of being graded to a method of learning (Yang et.al, 2019).
    a. Self-explanation.

An important skill that learners need to acquire is the ability to interleave multiple concepts or principles together rather than focusing exclusively on one concept. Activities that encourage learners to draw on what they have learned and connect the concepts together help them consolidate information in their long-term memory, hence increasing learning retention. Self-explanation can be used in learning design as activities that ask learners to write a short summary of what they learned or draw concept maps or diagrams. Evidence shows that creating written explanations or drawing diagrams of the main ideas are more effective than rewatching videos, with written explanations being the most effective of all (Fiorella et.al., 2020). These techniques further constitute a form of elaborative rehearsal in which learners link new information with information they already know. This type of encoding and rehearsal serves to increase learning retention and move information from short-term to long-term memory (Rammsayer & Ulrich, 2011).

Elaborative Interrogation

Another form of retrieval practice is using elaborative interrogation, which helps learners connect new information to their prior knowledge. Evidence suggests that elaborative interrogation can promote learning of facts and deep thinking (Woloshyn et.al., 1992). Whereas this strategy can be done independently by learners posing "why" and "how" questions before subsequently answering these questions, they may not focus on the right information or may not have the prior knowledge to carry out this task effectively. Thus, learners need to be guided to properly use this strategy to form good questions and find the right answer that expands their understanding of the core concepts. In an instructor-led training, guidance can be provided by giving instant feedback on the questions and what to focus on, while in an online environment, "why" or "how" questions can be provided to learners to redirect them to the right information. Another form of integrating this strategy is using multiple-choice questions that use "why" and "how" followed by options that promote understanding. Feedback on the answers is required.

Spaced Learning

A simple but critical intervention, spaced learning is the strategy enacted by spacing out learning activities on a given subject over time and planning for the learner to complete these activities at different intervals. Extensive research on this spacing effect has shown positive effects on recognition and episodic memories as well as improved retention (Matos et.al., 2017; McConney et.al, 2021; Tabibian

et.al., 2019; Veremis et.al., 2022; Versteeg et.al., 2020; Xue et.al., 2011). In an online environment, spaced learning can be implemented by spacing the online activities on key concepts throughout a course as opposed to confining these concepts to a single learning unit.

Similarly, learners can be guided on how to use this strategy to improve the retention of acquired knowledge. Several research studies have examined the application of online software that automates spaced repetition to find the optimal schedule for reviewing knowledge. For instance, spaced-repetition software (SRS) (Veremis et.al., 2022) provides a digital flash card system to organize information for spaced repetition. However, developing a series of SRS questions and answers can require considerable workload to develop, program, create content, and maintain. Moreover, several studies reported a decline in students' usage of the software over time, while they showed improved retention initially (Matos et.al., 2017; Tabibian et.al., 2019; Veremis et.al., 2022; Xue et.al., 2011). This challenge can be overcome by designing strategies based on the technology acceptance model (TAM) that target Perceived Usefulness and Perceived Ease of Use to improve spaced repetition and thereby improve learning gains (Veremis et.al., 2022; Xue et.al., 2011). This includes introducing spaced learning earlier in learning programs while periodically stressing the benefits of it to learners.

Separately, the practical application of knowledge to a real-world problem promotes retention and enhances long-term memory as such applications form a natural spacing and retrieval of knowledge and skills. For certain knowledge, such as that applicable to health emergencies, practicing by applying knowledge to a scenario or a simulated environment is preferable to ensure a low-stakes environment while retaining the stress and realism of a real-world scenario.

EXPLAINING HOW LEARNING WORKS AND NUDGING BEHAVIOR

Beyond enhancing the learning materials, spaced learning, and retrieval practices, the application of specific interventions, such as nudge theory, inspires behavioral changes in the learner in order to further optimize the time invested on OpenWHO. These interventions to inspire behavioral change can take several forms.

Growth Mindset and Normalization of Failure

The foundation of behavioral change for the learner is the promotion of a "growth mindset" as opposed to a "fixed mindset," the former expressing that our brains are highly malleable, dynamic structures that can be made to adapt and learn beyond what we consider natural limitations (Dweck, 1999). Consequently, it is important to be realistic with learners about their ability to retain information for the long term. Robust learning takes time to develop (i.e., quickly learned equals quickly forgotten) as the learning process often results in the collapse and rebuilding of organizing structures in our brain.

Encouraging learners to adopt a growth mindset can be promoted using a short instructional module that compares both growth and fixed mindsets and explains how to adopt the former when learning. Further, references to maintaining a growth mindset should also be made throughout the learning experience, particularly during knowledge checks to help learners overcome failure by reiterating the various benefits their efforts have in promoting retention.

Alongside promoting a growth mindset, learners must be given the opportunity and support to experience failure throughout the learning process. The normalization and promotion of failure as "a state of becoming" (Kornell et.al., 2009; Kornell & Son, 2009) is critical to sustained learning over the long term and reducing learner frustration by framing learning as a process, not an isolated event. In fact, "productive failure" may not maximize performance in the shorter term but enhance learning in the longer term (Kapur, 2016). For instance, designing conditions in which learners may not be able to generate correct solutions but must use their prior knowledge to generate suboptimal or incorrect answers can prepare them to learn better from subsequent instruction (Kapur, 2016). The growing body of evidence indicates that generating solutions to novel problems prior to instruction can help learners learn better from the instruction by consolidating or comparing information with what is already known (Kapur, 2012; Schwartz et.al., 2011).

How Learning Works and Explaining Why

As a direct extension of this encouragement to adopt a growth mindset and positive attitude towards failure, learners must be consistently informed of how learning works and the relevant

learning science and strategies that underpin the learning content and exercises throughout OpenWHO courses. Despite considerable advances in our understanding of how learning works, learning science is generally misunderstood by both educators and learners alike, and much of what seems intuitively correct about learning is often misguided and ineffective.

Therefore, as learners often do not know which strategies are most effective (Huelser & Metcalfe, 2012) it is important to share the science of how to learn with learners, explaining why a particular learning approach is used and challenging misconceptions and learning myths (e.g., rereading text, learning styles, blocked practice) to ensure these are not perpetuated. Sensitizing learners to learning science and the reasoning behind specific learning methods reduces frustration and assures learners that learning success is a matter of sustained effort over time. Explaining how learning works, among additional benefits, increases the opportunity for learners to apply these strategies to their own learning, thereby developing their ability to self-regulate their learning, and to decrease the fear of failure that is critical to learning. Lastly, it is also important to communicate to users that facing difficulties is essential to learning, a concept known as "Desirable Difficulties." Reassuring learners that the difficulties they face while progressing through courses is not only common but something desirable is an important perspective that allows learners to push through self-perceptions of inability, thereby increasing motivation.

As with promoting a growth mindset, learning retention concepts may be communicated to learners in several ways. For instance, using an introductory learning module (i.e., a recorded video) or self-testing exercise that ensures users learn and reflect on how learning can be most effective. Such introductory modules and exercises may also serve to provide learners with additional strategies and knowledge to enhance learning, such as focused and diffuse modes of thinking, managing procrastination, effects of lifestyle on learning (e.g., fatigue, exercise), and recommended note taking approaches to use during courses.

Nudge Behavior Change

Nudge is any aspect of the choice architecture that alters people's behavior in a predictable way (Thaler & Sunstein, 2008). An effective approach to operationalizing good behavior in learning is small interventions throughout the learning process that nudge learners to change behavior towards better practices. These interventions may take a variety of forms including nudge videos or content to provide brief insights, generate curiosity or reflection, and inspire action in learners to adopt and apply what they have learned into their daily practice. Nudging behavioral change may also constitute interventions outside of the immediate learning process. For example, learners may be sent notifications via a learning management system to invite them to return to courses left partially finished to continue learning, or learners may be recommended to set learning goals to align learning with personal or professional goals.

"Digital nudging" is another form that uses user-interface design elements to guide learners' behavior in digital choice environments (Weinmann et.al., 2016). Leading the learner to the most desirable choice in terms of learning habits can be done by notifications on spacing learning, reminders to apply what they learned into the real world, or simply providing incentives such as badges and points for accomplishing tasks. However, it is important that learning professionals understand digital nudges and apply them deliberately to guide learners to change behavior because accidental designs may lead to unintended consequences (Weinmann et.al., 2016).

"Behavioral insights" can also provide a crucial means of nudging behavioral change. The behavioral insights approach applies evidence about human behavior to practical problems (Hallsworth & Kirkman, 2020). Behavioral insights can allow us to know why and how learners act the way they do, allowing us to design and redesign learning experiences accordingly (Hallsworth & Kirkman, 2020). In general terms, providing information about how learners should change their behavior with respect to the subject matter of the courses they take may or may not lead to a change in behavior. This is because many of the choices in a learner's workplace may be driven by habits, established practices or policies, and the work environment, or the learner may simply lack the motivation to apply the newly acquired knowledge and skills (Hallsworth & Kirkman, 2020).

The application of behavioral insights can be achieved by using incentives or techniques that

lead to behavioral change. Some methods that can be adopted in learning design include:

1. **Metacognition**: An important element of the learning process is one's ability to recognize their current knowledge and what they lack to improve it (O'Reilly et.al., 2017). Thus, including reflective activities or asking learners to think about their acquired knowledge or its application in their own context constitutes thinking about thinking or metacognition. This can be achieved by prompting learners to think about what they know and what they do not know, and plan how to fill the gaps in their knowledge, attitude, or behavior. Similarly, prompting learners to think about their learning strategies and their effectiveness would be another method.
2. **Simulations with prompts**: Another example of an activity using a behavioral insights approach would be using simulations in which the learner has to make decisions to carry out tasks and prompting them with questions such as, "why does this matter?", or "what can I do to solve this problem?." In essence, learners need to see the consequence of their knowledge and choices.
3. **Utility-value exercise**: While the goals and objectives of a course are provided to learners, this can be flipped by asking learners to write down the value and goal of the course. According to principles of adult learning, learners need to see the personal relevance to the courses they take, which this exercise can help them do. Additionally, prompts to have learners reflect on achieving their goals should be provided (Kizilcec et.al., 2020).
4. **Feedback**: Providing feedback in learning activities is essential to help learners see their progress and areas of improvement. The more learners know about where they stand, the more likely they can see the value of the course they are taking.

OPERATIONALIZATION OF LEARNING RETENTION ON OPENWHO PLATFORM ENVIRONMENT

It is important to first mention that the goal of enhancing learning should apply to both initial training activities (i.e., watching a course video, answering knowledge check questions) and retention-related activities (i.e., those review activities that occur after the initial learning to ensure knowledge is correctly stored in long-term memory), as neglecting either limits the impact of learning activities as a whole. In this section, we present our current practices, future plans, and recommendations for the OpenWHO platform.

Technological constraints are ubiquitous in online platforms. Given the current functionality of OpenWHO—based on the open learning management system software developed by the Hasso Plattner Institute (HPI)—the platform can host a variety of retention-related activities within the sequence of initial training activities. This can be done using H5P question formats, an open-source plug-in for embedding interactive learning content into learning software that includes open-response questions, fill-in-the-blanks, flashcards, and single/multiple-choice questions among others. However, the platform is hindered by several technical limitations, such as a lack of in-video quizzes/knowledge checks, limited evaluation options for open-response questions (for which personnel constraints prevent oversight on each learner entry), and the aforementioned limitations on the scheduling of spaced-learning and retention exercises. Despite these limitations, different methods can be deployed to overcome the limitations of the platform, which will be presently described.

Course Announcement

The use of the course announcement feature and/or direct emails to participants (whilst ensuring General Data Protection Regulation (GDPR) compliance) is the most suitable mechanism to provide learning retention activities en masse to learners. This feature provides the ability to send custom text-based announcements and links to direct learners to specific activities either within the OpenWHO platform or external software (see activity examples below). These announcements can operationalize several aspects of the foregoing recommendations, including framing the learning activities, introducing or reiterating relevant learning science strategies or nudge theory, and providing instructions on how and when a particular learning activity distributed through the course announcement should be used.

In its current iteration, a disadvantage of the

course announcement feature is that there is no possibility to automate the scheduling for these announcements, nor can specific learners of a particular course be targeted (instead of all learners enrolled in a course). For example, consider a learner who has recently signed up for a course and receives an announcement for a spaced-learning retrieval exercise for their attention before they have finished the course. Such a learner will not yet benefit from this type of exercises and should only be notified once the course is completed (ideally, several weeks afterwards to ensure spacing from the initial learning) (Woloshyn et.al., 1992).

To overcome these limitations, the course announcement feature can be used to share a hybrid retention exercise that may contain information and exercises relevant to all learners. For instance, instructions and links to spaced-learning exercises (explicitly for learners who have completed their courses), learning strategies to develop learners' capacities, and a call for learners to complete the current course will accompany the current uses of the announcement feature: learning content updates (to recommend learners return to newly updated modules), the launch of new courses and recommended courses for learners to consider, and advertisement of surveys. Thus, despite the above limitations, the course announcement feature can still be an effective method to engage learners in retention activities.

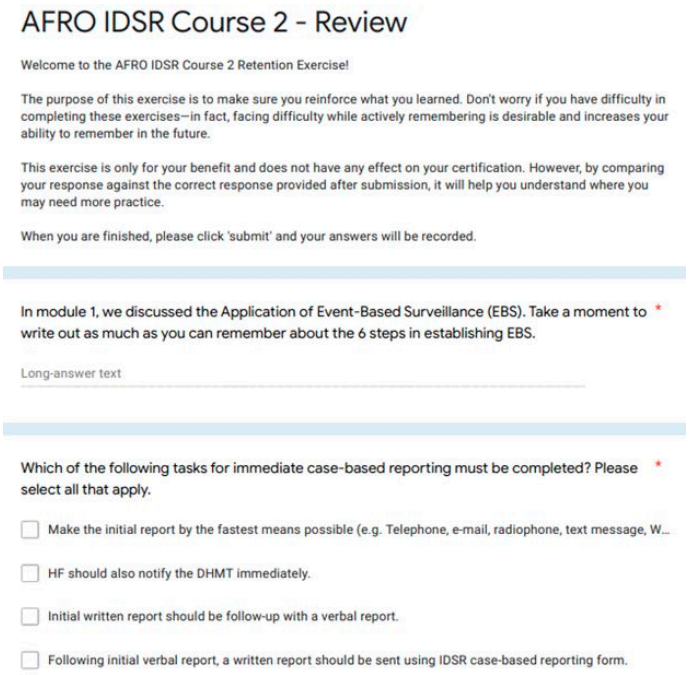
Activity Examples

The following examples include retrieval practice using all the learning strategies (i.e., self-explanation, elaborative interrogation, testing, and spaced learning) as they are spaced out in different intervals:

Example 1 (Annex 1) provides several retrieval exercises for the course Ready4Response Tier 1: Response context and principles hosted on OpenWHO. The exercise combines several learning strategies, such as explaining how learning works and why (including retrieval, spaced-learning, desirable difficulties), testing, and self-explanation.

Example 2 (Annex 2) provides further examples of retrieval exercises for the Integrated Disease Surveillance and Response (IDSR) Strategy course using similar strategies to Example 1, including open response testing and multiple selection question types to elicit retrieval (see Figure 2). Both examples are hosted on freely available software and are not graded nor have any effect on certification for the respective courses. Both exercises would be distributed to all learners who have received a record of achievement for completing all graded exercises within the respective course.

Figure 2. AFRO IDSR Course 2 Review



Importantly, the implementation of these practices need not be overly technical and can be distributed to learners with a range of low technology solutions. For example, the questions provided in the above examples may be provided in downloadable format, which would allow for physical and digital distribution to learners in locales without access to the necessary infrastructure.

RECOMMENDATIONS FOR FUTURE CONTENT DEVELOPMENT

Beyond the retention elements and methods for operationalizing recommended above, aligning the production of OpenWHO course content with evidence-based learning strategies is an essential component of increasing learning effectiveness and retention for learners. To this end (Matos et.al., 2017), recommendations and guidelines for course development will be developed and promoted to technical teams through learning support activities across the organization. Within these recommendations and guidelines, several important elements will be addressed including:

- **Shorter Video Lengths**: Individual learning components, specifically video or audio, should not have a duration longer than 9 minutes (ideally, 6 minutes), as learner focus drops off after this time (Brame, 2016). A strategy to manage this is to break up learning content to form natural breaks, or chunks, in order to reduce cognitive overload, which describes when a learner's short-term memory is overwhelmed with information. Of course, these efforts must also coincide with evidence-based design of the videos themselves (see subsequent point) and the limitations on working memory.
- **Apply the Embodiment Principles and Worked Examples**: While learning videos make up the majority of learning content on OpenWHO and are an essential means for providing information to users, video must adhere to evidence-based practices to ensure efficacy. For instance, best practices include ensuring the on-video speaker uses a conversational tone, maintains visible eye contact, and produces dynamic drawings and worked examples to illustrate points throughout a course (Fiorella et.al., 2019).
- **Apply Segmenting Principle and Reduce Transience Effect:** Videos are also affected by the transience effect in which a learner experiences cognitive overload as too much information enters the short-term memory and fails to be consolidated in long-term memory (Kalyuga, 2011). To reduce this effect, in-video quizzes can be integrated (Jing et.al., 2016), in which a video pauses during playback to ask the learner a question to check understanding before continuing. However, as this feature is not currently feasible, using retrieval-oriented questions following shorter videos (see above) enables knowledge checking questions to be asked. Lastly, the difficulty of these questions may vary from a simple multiple-choice question to an open-response question to generate the desirable difficulties necessary for retention.
- **Apply the Modality and Redundancy Principles**: Evidence has shown that overlapping on-screen text with narration leads to lower retention (Clark & Mayer, 2016). This is because learners may follow on-screen text while listening (whether as bullet points on a slide or as dynamic subtitles), reading and hearing the same text produces cognitive overload, thereby reducing knowledge retention. The exceptions to this rule are when the course language is not the learner's first language or if difficult and esoteric words are being used that might be new to the learner, both of which are highly relevant to OpenWHO. In these cases, voice-over narration benefits from on-screen text, and vice versa. However, it is recommended that subtitles be used instead of on-screen text as subtitles allow learners with less comfort in the language to see the transcript as it is spoken, while giving those comfortable with the language the option to toggle these and hide them.
- **Apply the Coherence Principle***:* Alongside the redundancy principle, presentation slides used through OpenWHO courses will contain far less information, specifically that which is extraneous and irrelevant, to ensure adherence to the Coherence Principle (Mayer & Moreno, 2002). Too much information can be overwhelming, reducing the ability to focus and follow when narrated. Similarly, visuals related to the topic will be used on the slides with the use of decorative visuals minimized, the latter resulting in extraneous cognitive overload.
- **Apply the Signaling Principle:** During a video presentation, important information or key points can be highlighted using the highlight feature or animated arrows to point out significant information. This will guide learners to focus on important information, consequently improving their learning retention of this information.
- **Apply the Spatial Contiguity Principle:** As video presentations can contain text and graphics, it is important that text appears close to the corresponding visuals. Evidence suggests that learners learn better when text and corresponding graphics are placed next to each other, making it easy for learners to remember the information (Makransky et.al., 2019).

- **Apply the Multimedia Principle:** While written or spoken text is essential for online learning, graphics—including diagrams, charts, photos, etc.—are recommended for inclusion alongside text, which leads to increased active learning and improved retention. Importantly, graphics should only be included when they support the text and not merely serve as a decorative element, with the latter only resulting in greater cognitive load without additional benefit to the learner.
- **Use Feedback for Each Response:** Feedback should be encouraged for every response in knowledge checks, module quizzes, and course reviews. Immediate, detailed feedback is critical for developing learner understanding and addressing misunderstandings of learning (McConney et.al, 2021). Feedback should always be made available to learners no matter their answer choice in either low-stakes or graded tests to clarify where their understanding is still lacking.

CONCLUSION

The main goals of this article were to present how learning strategies can be integrated in learning design to enhance learning retention and nudge behavioral change. The advances in cognitive science have useful implications on how to design effective online courses that improve learning retention or nudge changes in behavior where necessary. As research on learning strategies proves them to be effective when applied by learners, it is important to guide students to adopt these strategies in their learning process. As discussed in this paper, a combination of instructional methods and continuous support can result in learning gain.

As OpenWHO provides mass online courses to learners globally on health emergencies without the presence of instructors, it is imperative that the key learning strategies, such as self-testing, self-explanation, elaborative interrogation, and spaced learning, be integrated in the design of these online courses. Furthermore, these courses should contain prompts and feedback throughout to (a) improve learning retention, (b) nudge behavioral change, and (c) foster self-directedness and guide learners to adopt effective learning strategies. As videos are the main means of conveying information to learners on the OpenWHO platform, principles of multimedia learning are recommended to guide future design. In addition, technology constraints can be overcome with workarounds that make the application of learning strategies feasible for learners across the globe.

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APPENDIX

Welcome to the 'Ready4Response Tier 1' Review Exercise

We're delighted to welcome you to this review exercise, designed to ensure you retain and reinforce what you have learned in 'Ready4Response Tier 1: Response context and principles'!
Exercises such as these are essential to strengthen key knowledge you've gained for the long-term. To accomplish this, the exercises below make use of modern learning science, specifically retrieval (i.e. actively remembering what you have learned) and spaced-learning (i.e. remembering what you have learned some time after completing the course).
Don't worry if you have difficulty in completing these exercises—in fact, facing difficulties while actively remembering is desirable and increases your ability to remember in the future (even if you aren't able to reach the correct answer).
Important: This exercise is only for your benefit and has no effect on your certification. However, we recommend you compare your response against the correct response provided after submission (where applicable), which will help you to understand where you may need more practice/revision.
When you are finished, please click 'submit' and your answers will be saved.
Good luck and happy retrieving!

1

In module 1, emergency management was defined as the organization and management of resources and responsibilities for dealing with all elements of emergencies. It involves establishing plans and structures so that governments and the voluntary and private sectors can work together in response.

The aim of this response is to minimize three negative factors, one of which is 'disease and disability'. Please take a moment to recall as best you can the other two negative factors and write your response below.

Enter your answer

2

In module 2, we discussed the many organizations and entities (including communities) involved in emergency response, each with their own roles and responsibilities. This international response is comprised of four key actors.

Please take a moment to remember these four actors (we've given you one to help you along) represented by the four symbols below taken from this module.

Enter your answer

3

In module 3, we explored the role of the WHO in emergencies. In all cases, the response in an affected country should be led by the national government and *an international response is only triggered when which two events have occurred*?

Enter your answer

4

In module 4, you learned about the four **Humanitarian Principles** which provide the foundation for humanitarian action and response in emergencies. These principles are essential to establishing and maintaining access to affected people, whether in a natural disaster or a complex emergency.

Using the prompts below, try to recall these four Humanitarian Principles which align with the descriptions below.

H-------
N---------
I-----------
I-----------

Human suffering must be addressed wherever it is found. The purpose of humanitarian action is to protect life and health and ensure respect for human beings	**Humanitarian actors must not take sides in hostilities or engage in controversies of a political, racial, religious or ideological nature.**	**Humanitarian action must be carried out on the basis of need alone, giving priority to the most urgent cases of distress and making no distinctions on the basis of nationality, race, gender, religious belief, class or political opinion.**	**Humanitarian action must be autonomous from the political, economic, military or other objectives that any actor may hold with regard to areas where humanitarian action is being implemented.**

5

In module 4, we addressed the 9 Commitments to Humanitarian Standards which are followed during a response. Below, the graphic from this module is reproduced with several important words reduced to only their letters.

Please take a few minutes to write out each of the descriptions below with the missing words included.

Enter your answer

6

Research has shown that responses often go wrong due to several common reasons. One of these reasons is a 'lack of awareness of the situation, leading to a lack of detailed planning'.

Please take a few minute to write down as many of the reasons responses go wrong as possible. Consider your own experience as well as what you have learned in this course to help you answer this question.

Enter your answer

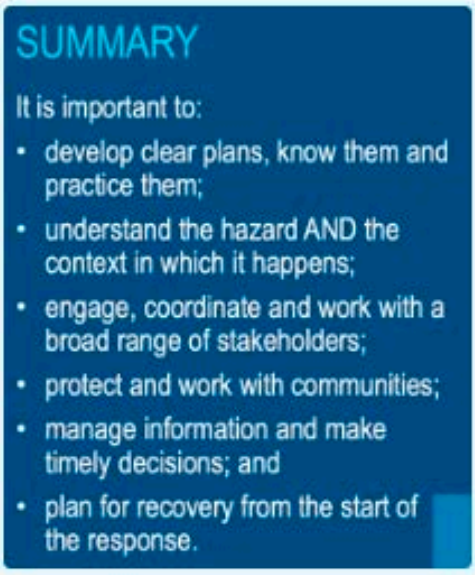
7

In module 5, we addressed three of the largest emergencies of the 21st century: the Ebola Epidemic in West Africa (2014-2015), the Earthquake in Haiti (2010), and Hurricane Katrina in the United States (2005).

From these examples, we presented a summary of the key lessons for responders to follow in emergencies (see image to the right).

Take a moment to reflect on these key lessons as they relate to your own country context. How have these lessons informed your own actions during the management of emergencies? Where could these lessons have been better applied in a context in which you have or currently operate?

Please record your thoughts in the space below.



Enter your answer