

Principle 7. Cognitive Load Must Be Managed in All Instructor-Led Events

Because the rate of the presentation is outside of the participants' control, all instructor-led events, including the virtual classroom, are especially prone to cognitive overload. To manage cognitive load in the virtual classroom, keep sessions relatively brief, heavily interactive, and reliant on visuals explained by instructor narration to deliver content. In addition, use worked examples to lead into practice exercises, as described in Chapter 8. To supplement virtual classroom events, be sure that participants have access to working aids to guide task completion during and after the virtual event.

Engineering Your Virtual Classroom Session

After receiving your virtual classroom assignment or determining that the virtual classroom is the most effective delivery medium to achieve your goals, proceed based on your starting point. Here we address guidelines for the two most common situations facing virtual classroom developers or facilitators: (1) converting an existing face-to-face course and (2) starting from scratch.

Conversions from Face-to-Face Classrooms

When the audience is geographically dispersed, many organizations are converting traditional instructor-led training into virtual classroom sessions. When faced with such conversions, begin by assessing the quality of the existing course. Often conversions to e-learning offer opportunities to improve classroom courses by making them more job relevant, more visual, and more interactive. Even if your classroom course is in excellent shape, you will still have to make some adjustments to convert it to synchronous e-learning. In this section, we show you how.

Upgrading the Existing Course

Begin with an inventory and assessment of the current course. Examine the student handouts, instructor guides, and slides for evidence of

the basic elements of instructional effectiveness. Answer the following questions:

1. Is the course overall logically sequenced and segmented into lessons?
2. Does each lesson include one to three learning objectives that use verbs that mirror job activities? For example for a salesperson, rather than "List the key benefits of Product X," a more effective objective is: "Explain how product X benefits clients with profiles A, B, or C."
3. Do the content, examples, demonstrations, and exercises incorporate job-realistic context?
4. Are there frequent exercises and assignments that require learners to respond in job-realistic ways?
5. Is 50 percent or more of the class time spent on learner-centered activities such as discussions, exercises, projects, case studies, and so forth?
6. Are visuals used in the course, and are there additional opportunities to add relevant visuals?
7. Is the content documented in ways that provide learners with reference aids for skills and knowledge they need to apply to the job after the class?

If any of the above is missing or inadequate, use your conversion project to improve the basic course structure by reorganizing, rewriting, or adding missing elements such as visuals or interactions. If your existing materials are highly inadequate and the course is high-profile, make a case to start a course development effort from scratch and follow the guidelines listed later in this chapter.

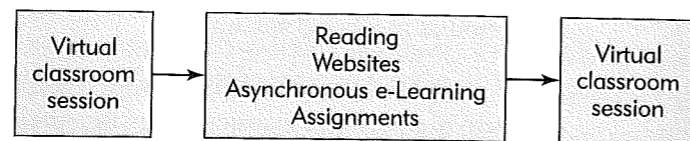
Converting the Existing Course

Even if the existing classroom course meets all or most standards for an instructionally effective event, you will need to adjust that course in ways that allow

facilitators to take advantage of the features unique to the virtual classroom that are different from the face-to-face classroom. Here are some guidelines:

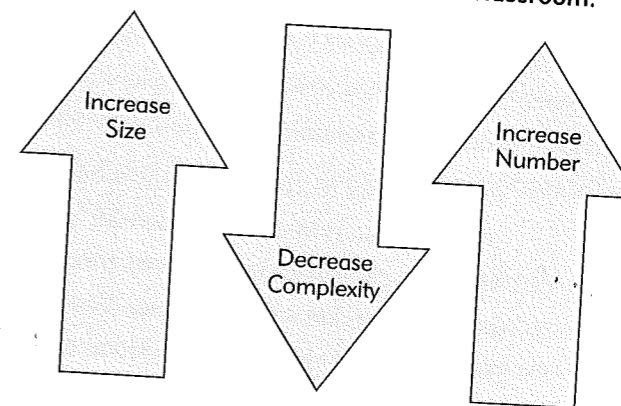
1. Reorganize content as follows:
 - Re-distribute some content to alternative media (Figure 12.4). For example, build in readings, websites, or asynchronous e-learning programs to off-load some of the content-heavy segments of the class. Allocate much of the virtual classroom time to events in which participants engage deeply with the content, the facilitator, and each other.

Figure 12.4. Distribute Some Content to Asynchronous Media.



- Re-segment remaining content into interactive virtual classroom sessions of approximately one to two hours each. In general, e-learning is better received in several smaller doses, rather than all at once. Learning outcomes are also better when the virtual sessions are interspersed with asynchronous assignments that require participants to apply the skills conveyed in each session.
2. Visualize content (See Chapter 5 for details.)
 - Inventory and re-purpose existing visuals for the converted course (Figure 12.5). Arrange for any technical adjustments needed to project video clips, such as editing or converting to different file formats. Redesign existing visuals that are too detailed or too small for virtual classroom delivery. Highly complex visuals can sometimes be broken down to multiple simpler visuals that build across several slides.
 - Work with a graphic artist to add more visuals where indicated. Most classroom sessions will have too high a ratio of words to visuals to convert directly into a virtual classroom session. You

Figure 12.5. Converting Visuals for the Virtual Classroom.



- will need to identify or create additional visuals. In addition to representational visuals, add explanatory visuals such as organizational, relational, transformational, and interpretive.
- Consider ways to make visuals interactive. Ask yourself how best to promote engagement, such as marking on visuals, responding to visuals via audio or chat, or constructing polling questions with visual alternatives.
3. Add interactions (See Chapters 6 and 7 for details.)
 - Inventory and re-purpose all existing interactions. You may need to video or audio record a classroom session to capture interactions or demonstrations delivered by the instructor that are not documented. Think of ways to convert lengthy open-ended classroom assignments into shorter close-ended interactions. For example, how could a series of short-answer questions be converted into polling questions? Consider how group activities run in the physical classroom can be converted into breakout sessions in the virtual classroom. Alternatively, some classroom assignments such as project work should be moved in whole or in part to asynchronous settings.
 - Add new interactions. A lesson designed for a physical classroom will usually lack sufficient interactivity to sustain attention and

learning in the virtual classroom. Adding new interactions will improve the instructional quality of the event. Apply the guidelines in Chapters 6 and 7 to create frequent, varied, inclusive, and job-related interactions.

4. Rework the introduction

- Inventory and recycle existing introductory content. Some of the classroom introductory materials may be used “as is.” Learning objectives, agendas, and instructor and participant introductions are a few examples. You may need to make some adjustments to the existing introductory materials, such as breaking up the content, putting it on slides, and adding relevant visuals such as instructor photos.
- Add introductory material to accommodate the virtual classroom. Augment existing materials in ways that establish social presence of all participants as well as engage participants with the response facilities of the virtual classroom right from the start. Create some introductory exercises that allow participants to use the various response facilities to learn something about each other. (See Chapter 9 for more details.)

5. Inventory and convert supporting materials

- Review student handouts. If you’re lucky, you may be able to recycle many of the existing student handouts. If you have reorganized the lessons for your conversion, you may have to do some editing, including resequencing of content.
- Revise handouts as needed. In many cases, traditional classroom sessions over-rely on student note-taking. Because of the amount of cognitive load already imposed by instructor-led events, we recommend that you prepare class handouts that use tables, checklists, and examples and can serve as job aids. If you can gather some of the notes taken by students attending the traditional classroom event, you may be able to re-purpose their content. If you anticipate using the recorded virtual classroom

event in an asynchronous format, adapt the handout to supplement the recorded sessions.

- Revise orientation letters. Much of the welcome letter material for the physical classroom will need to be rewritten to reflect the new logistics and technical requirements of the converted class. Follow the guidelines in Chapter 9 as the basis for your introductory information.
- Revise instructor guides. Instructors, especially instructors new to the virtual classroom, will need different types of information than is typically included in the traditional classroom instructor guide. Review the sample virtual classroom instructor script included on the CD and described in our Experts’ Forum discussion at the end of Chapter 9.

Starting from Scratch

You may be developing a new class that will make extensive use of virtual classroom technology. Before the decision to use the virtual classroom is carved in stone, consider whether, in fact, an e-learning solution is appropriate to meet the goals of the training and can be effectively supported by your organization. On our CD we include a Virtual Classroom Readiness Checklist that asks the many questions that should be considered before embarking on a virtual classroom design and development project.

Once the decision has been made to use the virtual classroom as part of your media blend, follow the initial stages of course design and development, just as you would for any training, by conducting a job analysis, defining learning objectives, and constructing course and lesson outlines. The main differences in your activities are:

- Plan for visuals from the start. As you do your job analysis, use digital cameras or get screen captures to start a repository of images you can draw on during development. If subject-matter experts make sketches on wall charts or paper, take pictures. The more visual

representations you can gather during the analysis phases, the easier your visualization efforts during development.

- Plan for fine-grained interactions from the start. As you write your lesson outlines, define a detailed sequence of content, along with ideas for interactions to accompany the content. Remember to vary the response formats and to make use of inductive and lead-in questions, breakout rooms, and response formats that maximize participant engagement, including polling, chat, and white board interactions.
- Consider alternative media to deliver content and for student project work adjunct to the virtual classroom sessions. Divide your content among the delivery media available to you, taking advantage of the strengths of your alternatives.
- Storyboard your session flow. Use PowerPoint slides to draft initial lessons, adding placeholders for additional needed art, interactions, content, etc., that will be filled in as the storyboards are completed. Use the notes section to summarize the main content points and add any additional directions to the instructor. If you have access to a graphic artist, he or she may have many good ideas to help you visualize your content. Storyboards offer a natural interface to work with the graphic artist.

The Bottom Line

From pre-engineering to management of cognitive load, by applying the basic principles summarized in this chapter you will develop virtual classroom sessions that are valued by the participants and offer a return on investment to the organization. In conversions of existing face-to-face courseware to the virtual classroom, take advantage of the opportunity to upgrade the legacy elements of the class as well as to make adaptations. When developing virtual classroom sessions from scratch, adapt your normal course development process in ways that effectively leverage virtual classroom features.

You best serve your clients by taking advantage of the features of new virtual classroom technology in ways that support human learning. As with all new technology, the instructional community will evolve unique strategies

that best exploit the nascent learning opportunities in today's virtual classroom. We hope this book will serve as a helpful resource on that evolutionary path.

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On The New Virtual Classroom CD

A Virtual Classroom Readiness Checklist offers a number of questions for you to consider when determining when and where to make use of synchronous e-learning technology for your instructional goals.

EXPERTS' FORUM

TEACHING JOB-RELEVANT SALES TASKS

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I have been involved in the design/development, facilitation, and blending of training programs to employees nationwide using web-meeting tools such as Breeze, Placeware/Live Meeting, WebEx, Learncentrix, and others. I have also used audio-only and voice over IP solutions as an element of long-term course interactions. I work with organizations to design and implement classroom, online, and blended solutions.

Principle 3 in this chapter recommends virtual classroom sessions that are job-relevant. I designed a course that needed to refresh business salespeople on an existing product and teach about a new product enhancement with an end goal to increase the number of new bids that salespeople wrote for existing clients based on the enhanced product. We offered online prework that refreshed the existing product and included a quiz for experienced salespeople to "test out" of the prework. A second prework module overviewed the enhanced product. The virtual classroom session (facilitated with Learncentrix LCMS) demonstrated how to apply the knowledge by creating a client bid using the enhanced product. Homework for the course required each participant to create a bid for the enhanced product for

any existing client. Participants "turned in" their homework online for review by facilitators. The facilitator offered corrective feedback. The salespeople were then free to propose the enhanced product in a bid to their clients. Several participants turned in their homework bids to clients. Several achieved their entire first quarter quota for the product by just turning in the homework.

In other well-designed courses, I have seen utilization of email communications with embedded scenario information or scripts from voice messages that provide information on projects to reinforce, give corrective feedback, or act as potential distracters to learners. I especially appreciated the courses in which all learners role played different parts on a fictitious project for a fictitious company. All of the application exercises were disguised as deliverables for the project.

Principle 5 recommends effective use of social presence. One of my favorite virtual class experiences was in attending a semester-long class facilitated by Allison Rossett. She kept us socially engaged during the entire session. Articles were often sent during the week before online sessions to give added context to the regular reading and assignments. She asked us about the examples in the articles and did not do much summarizing of content. We spent class time discussing concepts and applying knowledge. I found this more effective than courses that relied mainly on lecture and demonstrations. When engagement was expected, as a rule, participants tended to come to class more prepared and ready to discuss the material.

RECOMMENDATIONS FOR A RICH EXPERIENCE

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The challenges of working with a virtual classroom range from adapting existing instructional behaviors to competing for students' attention in an uncontrolled environment. However, the benefits combine to offer an even richer experience than possible in a physical classroom.

Leverage the Capabilities of PowerPoint Despite what some educators may think of PowerPoint, it remains one of the most widely used content development and training tools available. PowerPoint is a robust, mature presentation application that includes many things designed to engage an audience—make the most of it.

PowerPoint has a plethora of animation options, flexible navigation, and support for additional functionality that can include interactive content. With over ninety million users and over a decade of legacy content, PowerPoint is the most popular content development tool for training and is a great place to start for most trainers.

Preparing for Ad-Hoc Not all learning is done in the structure of the class session—virtual or otherwise. In the physical world, the time spent asking questions after class, or visiting a TA during open hours, or critiquing fellow students' work are all important adjuncts to standard classroom instruction. Virtual classrooms can be used after school, too. The key to being successful here is availability and immediacy. The benefit of a classroom is often in the wealth of materials that are readily at hand to effectively respond to whatever question is raised. Well-stocked, persistent virtual classrooms offer much of the same benefit. The immediate retrieval of course materials and results, access to additional information, and anytime, anywhere access all ensure the same, if not greater, benefits as for the real classroom.

Old Dogs and New Tricks—Adapting Physical Media More and more, physical actions that are common in a classroom (such as an instructor drawing on a white board) are able to be computerized and shared across a virtual classroom too; just as a real marker writes on a white board, its position is sent to a sensor attached to a computer and the computer simply re-creates the same pattern of motion in a drawing application to give an identical version on screen. Similarly, overhead projectors and foils or transparencies can be replaced by "document cameras" that capture a video of what is placed below it—making virtually any physical document instantly shareable.

Recordings—Worse Than Home Movies? Inevitably, there will be some students who just cannot make it to the "synchronous" learning event and will need to review the recording. So how valuable is the recording? How much of the critical interaction can be represented? Perhaps more than you think. There are products that can record more than just a "video" of what was seen on screen. Recordings can now provide interactive search, allowing viewers to find key words or topics that were on a slide or a note, or discussed in chat. Also, much of the interactive content can be presented

as interactive again right from the archive. And distributed materials associated with the session can even be downloaded or printed directly from the recording itself.

Beyond Polling For most applications, polling is restricted to multiple-choice or multiple-answer questions. But some applications go beyond simple polling, offering fill-in-the-blank-style quizzing, column matching, and more. These can often be used to stimulate conversations and capture subjective data.

Simulations Much of what we are asked to learn today is software-based. Many tools can be used to turn a live software demonstration into a repeatable capture, and then further into an interactive simulation that allows participants to truly test their knowledge. This content is ideally delivered in the synchronous classroom and then leveraged for asynchronous follow-up.

Game Play Preventing cognitive overload and engaging learners is extremely hard to do. The attention span of most students is low, even in real-world classrooms where external stimuli have been consciously restricted. The virtual classroom is even more difficult to control. The possible distraction of email, phone calls, television, co-workers, family members, and so forth all make keeping your audience engaged a challenge. One of the best ways to gain whole-scale engagement is through interactive competition. The connected nature of online learning offers the unique opportunity to involve everybody through multi-player games. And gaming does not have to be unrelated (any game can initiate the key social interactions or re-energize an audience), but gaming can be related to the material being presented.

Applications Many interactive applications can be easily created for online use or re-purposed from existing content. For example, you can quickly build online applications without any programming, using nothing more than a spreadsheet and some readily available software. This is ideal for creating targeted applications such as a mortgage calculator or financial or scientific scenario modeling visualizers. Also, being online offers the unique capability of interacting with "live" data and real applications, where appropriate. As illustrated, actual job-related materials go a long way toward engaging learners.

Consensus Applications The potential for this has yet to be tapped. There are a number of common group decision-making tools that are visual, subjective, and not easily represented by any other method of data capture, such as polling. An example of this would be a SWOT evaluation. Many people use this tool, which has individuals place a dot somewhere in a quadrant of four that represents a two-axis continuum of strengths to weakness and opportunity to threat. The distribution of placed dots spread across the two-dimensional chart quickly reveals consensus or disagreement in not one but two related issues.

Through all of these mechanisms, our virtual classrooms can go beyond simply re-creating traditional classrooms and can truly take us to a better way of instructing and learning.