

# VR Powered Immersive Learning

## Delivers Immediate Impact on Bottom Line Growth for Globally Dispersed Pharma Manufacturing and Quality Teams

Virtuosi® is the singular Pharmaceutical Industry educational platform designed with employee learning, and upskilling at the center. Our teams are populated by pharma, adult learning, and virtual reality experts who understand the unique needs of your industry, because we've been there. Available in **English, French, German, Spanish, and Swedish** operators and scientists engage in critical thinking and comprehensive skills synthesis via active engagement in a series of innovative 2D, asynchronous, on demand technical courses called Episodes. New skills acquisition and existing skills refinement become “sticky”, resilient, and cross functional because our Virtual Reality (VR) interactive experiences immerse the learner in hands-on settings ranging from microbiological laboratory testing applications to aseptic and ATMP/Cell and Gene manufacturing.

Virtuosi offers a unique value proposition to the industry by catalyzing learning into action. The “Why” and “How” of GMP aligned, advanced manufacturing techniques are embedded with superior efficacy for long term retention. Staff engage in a virtualized, state-of-the-art manufacturing and laboratory facilities in a zero risk environment on demand; that means no scheduling of line shutdowns or risk to your equipment and a profound reduction in SME overstretch!

### Minimize risk | Reduce time to market | Scale quickly

#### THE CONTENT

- 56 Episodes comprised of engaging and interactive video based technical courses
- Content Focus: Foundational aseptic principles, advanced aseptic principles and processes, as well as operational programs covering both manufacturing and microbiology
- Durations: 60 to 90 minutes per on-demand episode; segmented into 2 to 12 minute lessons, allowing users to step away and come back as their schedule allows
- 26 VR experiences immersing the learner in multiple manufacturing and microbiology environments, ranging from gowning room, filling line, horizontal unidirectional flow hood, to laboratory bench
- Over 100 hours of educational material delivery, including process checks and knowledge assessments

#### THE PRODUCT

- The Virtuosi hardware package includes a VR-ready workstation and HTC VIVE Pro Eye® system. The state-of-the-art HTC VIVE Pro provides true-to-life precision tracking within the painstakingly constructed Virtuosi VR aseptic facility and microbiology laboratory.
- Our on-demand education and technique instruction content is seamlessly integrated with the VR experiences via an embedded Learning Management System (LMS)
- The cloud-based content allows for effortless delivery of updates should regulatory requirements change over time
- Each seat-licensed user has a unique username and login credentials for single sign-on and traceability of that employee’s progress within the educational curricula. Individualized training records are generated based upon successful completion of each Virtuosi Episode and associated VR Interactive Experience.

## EXPERIENCE LEARNING

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# CURRICULA

**KEY:** ■ Signifies Course  
VR Signifies VR Interactive Experience

## MICROBIOLOGY FOR STERILE MANUFACTURING EXPERIENCE

- Industrial Microbiology
- Microbiology Laboratory Practices
  - VR *Serial Dilution Technique and Usage*
  - VR *Pipette Use*
- Media, Buffers, and Reagent Management
- Aseptic Technique and Behavior in Laboratories
  - VR *Hand Washing*
  - VR *Vertical & Horizontal Unidirectional Air Flow*
- Sampling and Sample Management
- Microbial Identification and Culture Maintenance
  - VR *Streaking for Isolation*
  - VR *Gram Staining*
- Microbial Limits Testing
- Sterility Testing
- Bacterial Endotoxin Testing
  - VR *BET Solution and Sample Preparation*
- Preservatives and Antimicrobial Effectiveness Testing
- Sterilization Indicator Control and Usage
- Microbiology Data Evaluation and Reporting
- Microbiological Investigations
- Microbiology Method Suitability

## STERILE MANUFACTURING EXPERIENCE

- Sterility Assurance
- Aseptic Technique and Behavior in Manufacturing
  - VR *Hand Washing*
  - VR *Fallen Vial Intervention*
  - VR *Needle Change Intervention*
- Gowning for Classified Environments
- Sterilization Process Control
- Terminal Sterilization Process Control
- Sterile Filtration Process Control
- Depyrogenation Process Control
- Isolator Process Control
- The Math and Science of Sterilization and Depyrogenation
- Facility Cleaning and Disinfection
  - VR *Techniques of Walls and Floors*
- Air Flow Pattern Studies
  - VR *Vertical and Horizontal Unidirectional Air Flow*
- Environmental Monitoring
  - VR *Environmental Monitoring*
  - VR *Sampling Plan Development*
  - VR *Contact Plates and Swab Sampling*
- Manufacturing Equipment Use Cycle
- Making Vertical and Horizontal Aseptic Connections
- Equipment Cleaning
- Formulation of Bulk Product
- Container Closure Integrity and Visual Inspection
  - VR *Visual Inspection of Vials, Ampoules, and I.V. Bags*
- Aseptic Process Simulation

## CELL AND GENE | ATMP EXPERIENCE

- Introduction to Advanced Therapy Medicinal Products
- Life Science Fundamentals - Cells, Genes, and Proteins
- The Science Behind ATMPs
- Advanced Therapy Manufacturing Overview
- Quality Management
- Quality in Manufacturing Support Processes
- Gowning
  - VR *Gowning*
- Pipettes and Pipette Aids
  - VR *Large Volume Pipetting*
- Cell Therapy Manufacturing Overview
- Pipette Use and Care
  - VR *Introduction to Micropipetting*
  - VR *Pipetting Small Volumes*
  - VR *Multi-Channel Pipetting*
- Biosafety Cabinet Types and Uses
  - VR *Biosafety Cabinet First Air Principles*
- Preparing to Work in a Biosafety Cabinet
  - VR *Preparing to Work in a BSC*
- Operating in a Biosafety Cabinet
  - VR *Working in a BSC*
- Gene Therapy Manufacturing Overview
- Aseptic Technique and Behavior in ATMP Manufacturing
  - VR *Aseptic Techniques and Behaviors*
- Introduction to Aseptic Connections
- Connectors - Types and Uses
- Tube Welding
- Aseptic Disconnections
- Fluid Transfers
- Sampling with Aseptic Connections
- Unit Operations
  - VR *Unit Operations\* (multiple interactives that can be assembled to simulate your process)*
- Aseptic Technique and Behavior in the ATMP Laboratory
- PCR Testing
- Advanced PCR Techniques

Virtuosi® is brought to you by Quality Executive Partners, Inc., (QxP), globally recognized management consulting firm comprised of leading technical experts and former quality executives within the pharmaceutical industry. Our field consulting experience has shown the critical need for innovative education. Only through real education can you experience real results. Leveraging the QxP "Teach and Do" methodology, Virtuosi is poised to radically change the pharmaceutical industry and positively impact the lives of patients.

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