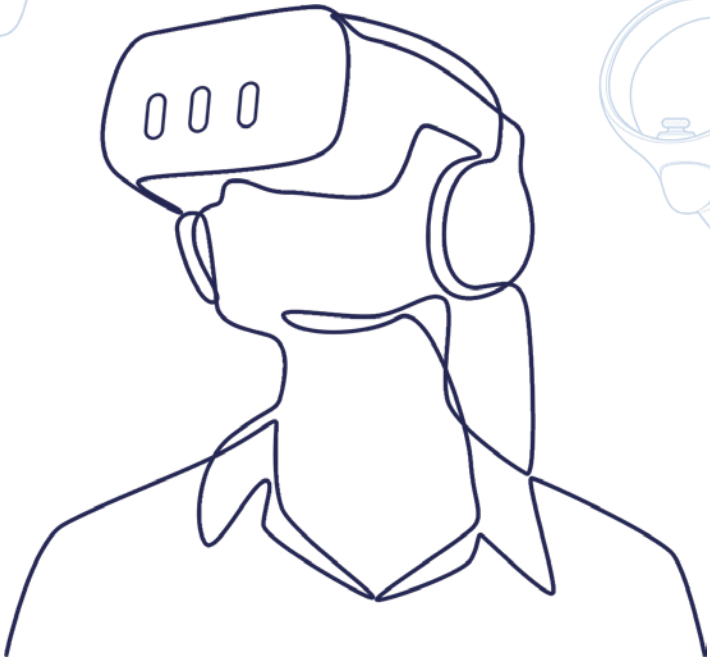
Oxford Medical Simulation



IMPLEMENTING VIRTUAL REALITY IN NURSING EDUCATION

A Practical Guide for Educators

More and more, advancing technology is making its way into healthcare education to address challenges educators, students, and practicing nurses are facing.

Educators are often stretched beyond capacity, particularly with a national nurse faculty vacancy rate of 7.8%. This may result in institutions needing to turn away qualified applicants, around 65,000 in 2023, which could further exacerbate workforce shortages.

With almost one-third of the current nurse faculty workforce expected to retire, the faculty shortage could become even greater, further stretching an already at-capacity staff.

While efforts are being made to address this gap, institutions are looking to other solutions to begin tackling this issue.

With newer technologies like VR and AI as hot topics, educators are finding ways to save time, reduce their administrative workload, and use advanced technology to support their courses and their students.

Embedding virtual reality into a nursing program can give educators valuable time back that would otherwise be spent doing tedious administrative tasks, and it can give learners objective feedback and standardized clinical experiences that are difficult to recreate using more traditional simulation methods.

Some institutions have reported savings of over 200 hours of staff time while providing students with a tool to help them build clinical decision-making skills that they can take with them into practice.

While there are many benefits to using technology in education, we know it's not easy to introduce a new tool into an existing curriculum.

Beyond the support you can expect from your IT team and the VR partner you've selected, we wanted to provide you with a resource you can reference as you think about how exactly to bring this tech to life for your learners.

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1 Understanding VR in Nursing Education

1.1 What is VR and how does it work in healthcare training?

The Healthcare Simulation Dictionary offers a more formal definition, but in short, virtual reality places learners in a virtual environment, complete with sounds, images, and patients that reflect real world practice.

In a nursing curriculum, you might find educators using this tool in a variety of ways, including:

- Live casting during classroom lectures to enhance didactic coursework
- Assigning scenarios as homework
- Providing opportunities for interprofessional practice with other disciplines
- Objectively measuring clinical performance for assessments
- Building communication skills with AI-powered virtual patients
- Progressing learners from fundamental to advanced patient care

We'll dig into these implementation models more deeply later on, but this is a quick snapshot to give you a few ideas on the creative ways educators are bringing VR into the curriculum for their students.

1.2 Key benefits of VR in nursing education

With some examples in mind of how educators are working with VR, it's important to talk a bit about the 'why'.

Virtual reality is not here to replace traditional simulation, it's here to complement a simulation program, acting as another tool in the kit to help learners prepare for practice.

The feeling of presence or immersion can enhance memory and engagement, and studies are reporting that VR simulations result in similar learning outcomes to other forms of simulation (while being significantly less expensive).

It's both helping learners build clinical confidence and can be much less costly than other forms of simulation.

Beyond that, you can recreate just about any situation in a virtual environment like situations that are hard to reproduce or conditions with symptoms that are difficult if not impossible to replicate.

Plus, VR simulations (depending on the provider) are scalable - you can reach as many learners as you need to, at any time that's convenient for them.

We're not talking about a few additional simulation opportunities here and there, we're talking about 20,000+ simulations run per semester.

There's a lot of opportunity with VR. More simulation, more often, with fewer costs and resources. Plus, standardization and personalization - guaranteed clinical experiences with personalized feedback.

Did we cover it all?...Probably not, but that's no worry - we've got an extra resource for you to have a look at the latest research (about VR in general and about OMS specifically). Check out our research page for more information.

2 Evaluating Your Institution's Readiness for VR

We've covered how and why VR is being used in nursing education today, so if you've made it here, you're probably looking for information on how to implement this tech, which is what we'll cover in this section.

2.1 Identifying your curriculum needs & determining readiness

Identifying where VR fits best in your curriculum can be a tedious but crucial step to ensuring you get the most out of VR. Just like any other simulation method, virtual reality has a time and place, so it's important to figure out where VR can fill any existing gaps or enhance current content before diving into finding a vendor.

Start with your courses and curriculum - what are you already doing where VR could fit? Do you have an existing simulation lab where you could house headsets? Or would you consider having learners access simulations on their home computers as assignments?

These are all considerations for where VR can fit into your curriculum, which will help you in your conversations with potential vendors.

At OMS, we can walk through the curriculum mapping process with you - given we have a library with over 260 scenarios, our Educational Specialists can point you in the right direction, especially if you have learning outcomes or course objectives in mind.

We've even created a guide about it - have a look if you'd like to know more about how we can help you with this part of the process.

Once you have a clear sense on where VR may fit for your educators and learners, you'll want to get a better understanding of how ready your institution is for a VR implementation process.

3 Choosing the Right VR Solution

Let's say you've done the initial research, you know what you want to use VR for, and you're ready to start the search for a VR partner - so exciting!

You'll need whoever you work with to support your implementation process, give you data to help determine success, and they should have enough resources and content in place to ensure your learners get the scenarios they need.

3.1 Defining your goals

If you can, it's best to go into these conversations with a good understanding of your learning objectives and goals.

That might look like:

- **Course competencies**
- **Expected learning outcomes**
- **Accreditation standards you align with**
- **Content, course type, or specialty area(s)**
- **Modality preferences (communication scenarios vs. procedural scenarios)**

Having an idea about these areas in hand before engaging in conversations with vendors can help steer the direction of your meetings, giving you a tailored VR program rather than a high-level or broad conversation.

3.2 Key features to look for in a VR platform

Of course, you've got to be sure the VR vendor you work with has the scenarios you need. Here are a few ways you can determine if a VR vendor has what you're looking for.

1. Do they have an extensive library?

For some, a small library might suffice, with a limited selection of scenarios. As we like to say at OMS, sometimes more is more.

Our existing library consists of over 260 scenarios, ranging across difficulty levels and specialty areas.

We cover fundamentals, emergencies, mental health, maternal health, pediatrics, clinic or primary care - the list goes on!

Make sure any specific content needs you have are covered. Consider asking for a full list of scenarios so you can see for yourself what they offer.

2. Do they offer any other types of modalities?

How are their scenarios run - do you point and click, are they menu-based, or is it done via hand interaction?

Depending on your learner level, you may want something menu-based that provides a framework for more novice learners.

For advanced learners, a hand interaction environment is more open and can increase the cognitive load of the scenario.

Using AI-powered voice control in scenarios means learners can dialogue with virtual patients, having real conversations in the virtual world. Again, this is more open and advanced, so it may be of interest to you to understand the various offerings of a vendor.

3. Can you customize scenarios?

Sometimes, you may need scenarios to reflect institution-specific protocols or meet specific learning objectives, in which case, a VR partner with an authoring platform is a must.

Maybe you like one particular scenario but need to change its difficulty level, or you'd like to adjust feedback and add in your own.

There are a lot of ways you can utilize an authoring platform, like OMS Create, to make the most out of every scenario.

If an ability to customize is important to you, make sure you ask about the option for access to an authoring platform.

4. Are scenarios realistic?

Of course, many vendors will claim to have realistic scenarios, but it will be up to you to determine if they're realistic enough for your needs.

Don't hesitate to jump into a headset at a conference or request a demo. As they say, try before you buy!

At OMS, all scenarios have an underlying physiology engine which means that the virtual patient will display real time symptoms of their condition(s). If there's an error, like a wrong medication is administered or there's a failure to escalate care, the patient's status will decline as it would in real life.

That also means that when the condition is addressed appropriately, symptoms will improve.

Another good example of this is our AI-powered Voice Control scenarios, that allow for open dialogue with virtual patients. These also house an emotion engine, so virtual patients will respond based on a number of factors, like tone or intent, making these simulations even closer to real world care.

Realism in simulation can mean different things to different people, so be sure to see what it is you'll be using and try to get an understanding of how scenarios are powered. This will give you a lot of good information to make an informed decision about which partner to work with.

5. Do you get any data from the platform?

While it's great to provide learners with a realistic simulation, we know that much of the learning takes place in the debrief.

Learners need information about their clinical performance to reflect, ask questions, and gain a deeper understanding of how theory applies to practice in order to get the most out of a simulation.

Be sure to ask about any data that gets collected and displayed for learners and educators.

For example, the OMS platform provides information about clinical performance, with detailed and evidence-based feedback. There are both individual and cohort-level data sets shared with educators to help them make informed decisions about competency progress as a whole or individual needs.

Know what all you'll be getting - from the scenario itself to the data shared and the usability of the platform.

3.3 Evaluating vendors and technology partners

We've talked about some general features or questions you might want to ask when searching for a VR partner, but there's a whole lot more you can dive into around this topic.

We recommend getting your learning objectives and any other needs sorted ahead of a conversation, so you go into it with a clear picture in mind of what you're looking for out of a VR partner.

But if you're like many healthcare professionals, time is a limiting factor.

That's why we put together a whole guide to help you navigate the process, with more detail on features to look for & questions to ask. Check it out here for a more detailed look at selecting your VR partner.

4 Different Models of VR Implementation

4.1 Identifying fit for implementation models

What do we mean when we talk about "implementation models"?

These are some of the use cases where VR has been successfully used in a curriculum.

A few key ways to use VR in the curriculum are:

- In-department simulation
- Distance learning
- Didactic teaching
- Assessment

In-department simulation

VR is a great way to take your in-department simulations to the next level. It gives students a chance to dive into realistic clinical scenarios without needing a big physical setup or expensive equipment.

You can use it to create high-pressure, complex situations that are difficult to replicate with traditional methods. It's also flexible and efficient, making it easier to fit hands-on learning into your curriculum.

For in-department simulation, there are a few main ways to use VR:

1. Independent, facilitation-free simulation

In independent simulation, learners may take a headset home or conduct an on-screen scenario at any time that's convenient for them.

Many educators use this method to assign simulations as part of independent homework, encouraging students to engage in the scenario ahead of a related course topic or prior to coming in for a physical simulation, like ACLS.

2. Group, facilitation-free simulation

This type of simulation can be used in the classroom to support group-based or case-based learning.

Often, one learner will open the scenario and cast it to another device, like a TV or large monitor.

The group will then work through the scenario together, and when finished, can discuss findings and reflect as a group before debriefing with the larger classroom.

3. Faculty-led, group-based simulation

This can be a particularly useful way to bring coursework to life for students.

The faculty will cast the scenario to the classroom, and the entire class will work together to treat the virtual patient.

Faculty are able to lead the discussion and assist students in navigating the patient case, which can be a great method to work through situations for novice learners or for complex clinical situations.

In-department simulation is one of the most common ways institutions deploy VR simulation, and if you'd like to learn more about why Fiona Suthers, Head of Clinical Simulation, thinks "OMS is the most valuable learning tool that we have in the simulation center", see our case study with Middlesex University.

Distance learning

VR makes hands-on simulation accessible no matter where your students are, which is why it's a great fit for distance learning.

Students can practice clinical skills, explore realistic scenarios, and get instant feedback—all from the comfort of their own space. It's a powerful way to keep remote learners engaged and ensure they're getting the same high-quality education as those on campus.

Here are a few common ways VR is being used to support distance learning:

1. Independent, remote simulation

All students will need is a VR-compatible device, like a laptop or headset, and they can begin autonomous practice in the safety of the virtual environment.

They can reflect independently with immediate, evidence-based feedback, and practice as much as needed before debriefing with faculty or a larger group.

2. Group, remote simulation

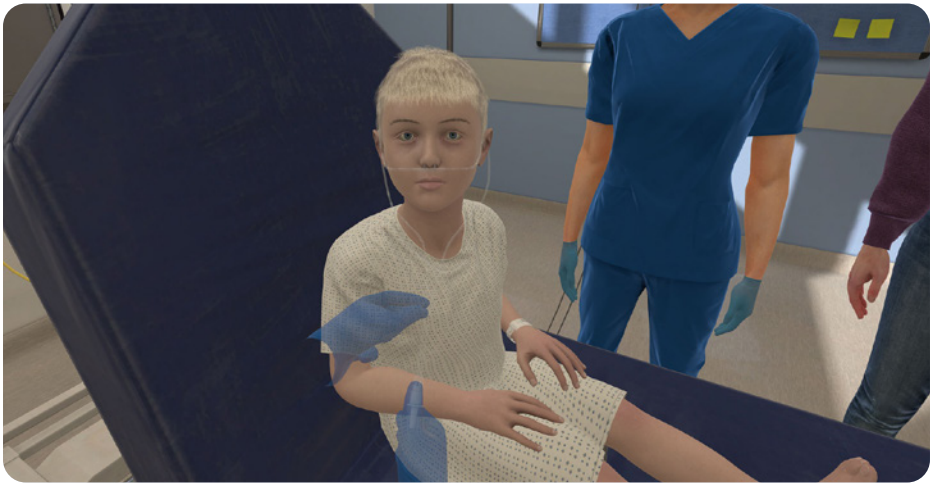
With video conferencing tools, learners can work together and screen-share as they work through a scenario.

This facilitates group-based work while all participants can remain remote. You can even use breakout rooms for this type of simulation as part of a didactic lecture, incorporating case-based learning into your distance education.

3. Faculty-led, group distance simulation

Similarly to the above, faculty can screen-share the scenario as the class walks through the simulation together.

Distance simulation is being deployed extensively to scale access to simulation. Learn from the faculty at Nightingale College and the University of New Brunswick to learn more.



Didactic teaching

Virtual reality can be a key piece in didactic coursework, helping bring concepts and theory to life and bridging it to practice.

Particularly for novice learners, this is a great way to engage students in building their skills in the safety of the virtual world.

Here are a few of the ways VR has been implemented to support didactic teaching:

1. Bringing clinical concepts to life

To support a course concept in the classroom, faculty can project a scenario onto a monitor and walk through the clinical case as a group - some faculty have incorporated features like a bluetooth mouse to support engagement from individuals during the classroom session.

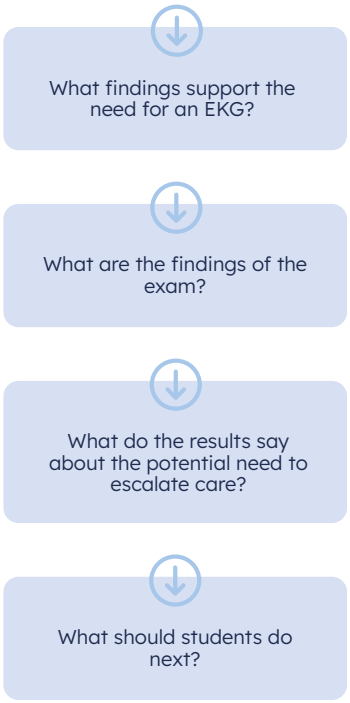
In courses that may not have a clinical component, like the pharmacology course at Saint Joseph's University, this can be a great way to "help bring clinical pieces to life in the classroom", and this method "takes everything we learned in the lecture and puts a face to the disease process."

2. Targeted practice for specific skills

Hand control scenarios can support procedural skill development and voice control scenarios can support communication skills, but there are several ways to incorporate other scenario types in the classroom for lecture-related materials.

In a cardiovascular course, for example, faculty can project the OMS EKG Interpretation scenario to help students visualize the concept as it relates to a patient case in real time.

Faculty can work through the timing of the EKG, asking questions like:



These specific skills can translate directly to practice, and are even valued by nurses currently in practice. Take it from Sarah Huber, Quality Outcomes Coordinator of Surgical Nursing at Carle BroMenn Medical Center. She said of her OMS experience, "Doing the VR did make me feel more confident in treating sepsis, and...the biggest reason is because of the feedback."

For even more targeted practice, faculty can use portions of a scenario to highlight specific skills or dive deeper into a course concept.

3. Bookend course concepts

To bookend a course with VR, faculty can assign a scenario to students ahead of the lecture that will introduce a particular topic.

Students are able to engage in a meaningful way with the upcoming course content, which can help them prepare practical questions that support bridging theory to practice.

Faculty then go through the course content in the classroom, as they normally would, and then assign a separate but related scenario to students following the classroom lecture.

Data and analytics from the OMS platform, for example, provide insights for faculty into competency from an individual or cohort level, which can help faculty determine knowledge retention or gaps that require further class time to unpack.

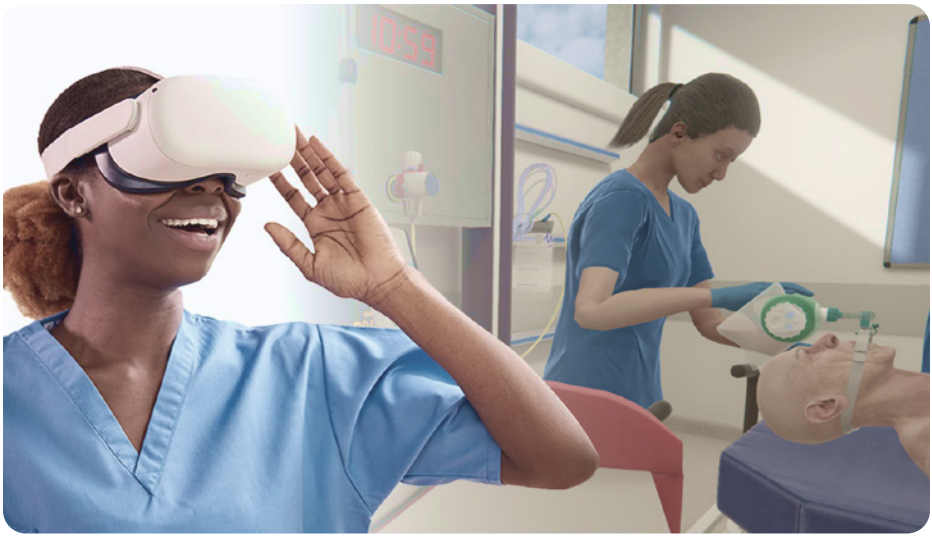
In using VR to bookend key concepts, faculty can create a dynamic learning experience that keeps students engaged and supports different learning styles in and outside of the classroom.

Assessment

For many educators, standardization is key for objective testing. However, with more traditional methods, consistent experiences cannot be guaranteed throughout the day.

As OMS scenarios are standardized, they can be used in assessments. The platform will track actions taken or not taken, timestamps, and will provide immediate feedback on clinical performance.

This allows educators to spend their time in the theoretical and application evaluation, rather than tracking time or accounting for inconsistencies across experiences.



Here are a few of the methods used in VR for assessment:

1. Distance assessment

Learners in this situation can both prepare for and complete their assessment at home. Faculty simply assign the appropriate scenario and determine the time at which it will open.

Learners can then run the scenario autonomously, and faculty can utilize the feedback and data provided by the platform to ensure engagement, track progress, and gain insight into clinical performance.

2. In-person, faculty-supervised, individual assessment

This method reflects the common practice of in-person assessment, assigning a case to students and observing their application of skills through a realistic scenario.

With stations, either in a headset or on screen, multiple evaluations can take place at the same time.

Faculty can observe students' actions either projected onto a screen or can make use of screen recording tools to review rather than directly supervise in real time.

3. In-person, faculty-supervised, group assessment

Similarly, this can be done with group-based assessments.

Learners will manage a scenario together as a group, while the faculty can either observe a projected scenario on a screen or utilize a screen recording to evaluate at a later time.

For some institutions, using OMS has "made a massive difference to the way we think about assessment", saving educators time and bringing students more opportunities for autonomous practice.

To learn more about implementation models for VR, check out our handbook on VR Simulation Implementation Models, which contains more detail and an additional section around debriefing from VR, as well.

5 Ensuring a Smooth Rollout
Orientation & Pre-briefing

Preparation is a vital step to ensuring that both learners and educators are ready to dive into scenarios and get the most out of them.

This section will cover the importance of orientation and prebriefing, with helpful tips on how to make sure everyone participating is on the same page.

5.1 Preparing faculty for VR implementation

Before students ever launch a scenario, the faculty using VR will need to become familiar with the technology and the platform.

For many, the platform is intuitive and easy to use, but just like any new piece of technology, time must be dedicated to getting familiar with it and its best uses.

Spending even one day getting familiar with the platform can help faculty generate lots of ideas on where VR can fit into their courses, and it can make it easier for the group as a whole to get a better understanding of the technology itself and any basic troubleshooting needs you may need to be aware of.

The University of New Brunswick put together a very successful faculty day as part of their curriculum review process, to join everyone together in getting familiar with this technology. Read their success story to learn more about how they achieved faculty buy-in and are working to expand their use of VR across their nursing curriculum.

5.2 Student orientation to VR

Once faculty have a basic working knowledge of the technology, it's time to orient students to the platform.

Beyond the typical account creation so students can log in, it's important to provide either written or other materials to address any anxiety or technological questions that might come up prior to getting into a scenario for the first time.

For some, this can look like a written guide alongside the syllabus or a hands-on training session in the classroom as a first look.

Setting expectations for students on what the set up will look like, how long the simulation will take, and getting oriented to the virtual environment can help ease concerns and will help reduce troubleshooting issues with the first working sessions.

Following an orientation, a pre-brief can help learners understand the importance and relevance of the scenario they'll be running and how that connects to their learning objectives.

It's also important to use best practices for comfortability and fit for a smooth VR experience.

Here are a few tips you can recommend for your learners as they get started in VR:

- **Take frequent breaks: Aim for a 10-15 minute break every 30 minutes**
- **Ensure proper fit: Adjust the headset so that it is comfortable and you see a clear image**
- **Stay seated: If standing is uncomfortable, know that you always have the option to remain seated, with feet firmly planted on the ground**

It may take a period of time to become acclimated to the virtual environment, and the easiest way to transition to the VR space is by ensuring the headset is comfortable, the image is clear, and you're taking frequent breaks while you get used to VR.

For more information about conducting VR sessions, we've put together a handbook called Running VR Simulations, so have a look there for more step-by-step guidance on setting up and running simulations for learners.

6 Expanding & Scaling VR

6.1 Setting up for long-term success & expansion

If you're like many other educators thinking about introducing VR into your curriculum, you may be wondering how best to get started.

In many instances, institutions choose to conduct a pilot prior to expanding. This allows for a smaller cohort to get introduced to the technology, limiting the amount of time needed for faculty to become fully versed in VR.

Consider having a roadmap in mind on how you'd like to expand VR across your curriculum before you begin an implementation process.

For example, you may begin with first year nursing students with fundamentals scenarios, and once you've collected feedback from students and faculty, use that data to inform expansion to more advanced cohorts of learners.

To learn from how others have successfully expanded, take a look through a few relevant case studies:

Knowing your priority use cases for VR is a great place to start, but it's also important to have a sense about where you'd like VR to go in the future.

While you don't necessarily need a fully mapped out 5-year plan, knowing if and how you'd like to scale can help immensely in guiding the initial implementation process.

Do you want to begin with first year learners and expand to advanced learners who are getting ready to begin their transition to practice?

Perhaps you'd like to begin with a smaller group of learners and scale up your VR simulations to hundreds of learners.

There are many avenues to take when thinking about growth and future plans, and while you don't need to have it all figured out to get started, having an idea of where you'd like it all to go can be a big help.

- **Saint Joseph's University: Faculty began with a pilot program and continue to expand their VR use across the nursing curriculum and within various programs**
- **Nightingale College: Expanded their use of VR to distance learners, now running over 20,000 simulations per semester**
- **University of Chester: Has successfully expanded their use of VR to complement didactic learning and supplement simulated placement hours**

7 The Future of Nursing Education

7.1 The power of VR in transforming nursing education

Advanced technology like AI and VR are already supporting students in their growth and professional development, bolstering communication, critical thinking, and clinical decision making skills.

It's being used to support didactic teaching, complement physical simulation, and supplement clinical placement hours - to name a few.

As technology becomes both a standard, and an expectation of many new learners, emphasizing immersive and meaningful learning experiences with more opportunities for practice is placing institutions at the forefront of merging technology with education.

7.2 Next steps – taking action now

While the process can feel overwhelming at first, we've broken it down into its smaller components, so you can take it one step at a time.

First, identify your key learning objectives and get a sense of where VR could fit into your existing curriculum.

Then, develop an understanding of your institution's readiness to implement technology like VR.

You can then begin your search for a VR partner, and work with your team to begin the implementation process.

Bring faculty into the fold from early stages, so everyone is on the same page about what this technology is and how it's best used to support learners.

Ensure everyone is appropriately oriented to the technology and feels comfortable using it, and then you're running your first set of VR simulations!

Make sure you're reaching out for support as you go along, connecting with peers or other experts - their experience can be incredibly helpful in setting the foundation for a successful VR program.

For more information or to start the conversation with an Educational Specialist

Book a demo with us

We hope this has been a helpful read,
and we look forward to hearing from you!

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