1. DEVELOP A RESEARCH QUESTION

Using what we have learned about developing research questions, write a research question that you would be interested in and capable of answering.

Develop your question based on ONE of the following prompts.

- **Historical Analysis**: Develop a question that inquires about a *significant historical event, period, or person* within your field of study.
- **Industry Analysis:** Develop a question that inquires about a *current trend, problem, or innovation* within your field of study.
- **Product Analysis:** Develop a question that inquires about *a current technology, consumer product, or brand* within your field of study.

a) Identify which type of analysis (from the three listed above) your question will explore.

Industry Analysis: Virtual Reality

b) Write your research question in the space below.

How could Virtual Reality technology grow and change over the next few years?

2. JUSTIFY YOUR RESEARCH INTEREST

Explain why it would be professionally helpful for you to understand the answer to your chosen question and why it represents a good fit with your current level of experience and knowledge.

I have heard much about Virtual Reality as an upcoming technology of the future and have seen some of the things it can do currently in demos. But it is still a new technology that has yet to take true root in our lives in the same way other technologies like smart phones or Bluetooth have. Part of this is because it is still relatively new, and we are still exploring the best ways to enhance and utilize it, whether in our homes, or in various areas of our society and industries. I felt this would be a good open topic to explore because it is an upcoming technology that has a chance to become commonplace enough for software opportunities to grow. As those companies grow, they will need many skilled members like software developers to create these new products. It seems a good idea to keep an eye on upcoming technologies for a sense of potential job markets in the future and what skills they may potentially value.

3. IDENTIFY A USEFUL SOURCE OF INFORMATION

Demonstrate your ability to answer your research question by identifying a relevant, appropriate, and reliable source of information. Use APA @ Conestoga style to list this source in the space below. Remember to consult our APA @ Conestoga website!

Chung, J. M. (2023). *Emerging Metaverse XR and Video Multimedia Technologies: Modern Streaming and Multimedia Systems and Applications*. Apress. https://learning.oreilly.com/library/view/emerging-metaverse-xr/9781484289280/html/532121_1_En_9_Chapter.xhtml

4. JUSTIFY YOUR POTENTIAL TEXT

Demonstrate the suitability of your supporting text by answering the following questions.

a) How do you know this source is trustworthy?

This source is a published book I found through the library online portal. I can trust the information is backed by the publisher who agreed to publish the information, as well as the library for allowing it to be among their resources.

b) What makes this source appropriate for your current level of experience and knowledge?

I would say the entirety of the book may be a bit more advanced than I am currently ready for, but the last chapter is summative and focuses on the authors general view of the technology and its future. I found this chapter mostly easy to read and relevant to my inquiry.

c) What will this source help you to learn about the topic of your research question?

This source helped me understand some of the predicted directions the technology could take. He made it clear that predictions were not set in stone, and these concepts were not guaranteed to happen. He talked first about the main area we all recognize VR from currently, the entertainment sphere. This is where we see various forms of relaxation and exploration users can experience. This can come in the form of things like immersive videos and games, interactive concerts and events, and avatar chat rooms to socialize with others and simulate various environments. The author also talks about the current issues we must face with this emerging field, like how to protect children and other users from malicious or aggressive players, requiring a more robust security and monitoring system to keep virtual environments safe and comfortable to interact in.

Medical and education uses are also a large aspect, as VR can simulate training environments for practitioners to teach or practice their skills before interacting with the real thing, which can come with real consequences if mistakes are made. With virtual environments, the costs of training can significantly decrease, and the methods used can be more interactive and help form experience. Technology like haptic feedback and better visual design will be crucial for these aspects, as they will help ground the experiences to their real-life counterparts.

The author also talked about feedback technologies to enhance VR to feel more immersive by bringing in more of the human senses into the experience. Things such as physical feedback sensations when interacting with virtual environments, increasing the sound capabilities of headsets for a more immersive sound experience, or even exploring currently unutilized senses like smell and taste.

Some technologies could focus on the brainwaves of users, to read their emotions and brain patterns, predict their desires, and interpret directions and commands without the user needing to give additional input. In a sense it would integrate the virtual environment to become part of our own imaginations, where our thoughts are able to mold our experience on screen. This can be used outside of entertainment and used for utility and medical purposes as well, such to communicate or a way to diagnose abnormal brain activity that could indicate a health concern. This can be a scary path to explore, as the ethical matters come into play, but with proper regulation and care, could lead to a wealth of possibilities in both the entertainment and medical fields.

The author also speaks on how VR is not an isolated technology and can be used alongside other technologies like AI or cloud computing to enhance various aspects of VR’s capabilities. Overall he has a very general yet in-depth perspective on the next steps and focuses in the Virtual Reality sector of technology.

5. USE ARTIFICIAL INTELLIGENCE (AI) TO HELP YOU DEVELOP YOUR THINKING

Generative AI software programs are not a suitable replacement for academic research and individual writing, but they can potentially contribute to *your thinking process*.

Type your question into an online generative AI program and paste the response in the space below.

Virtual Reality (VR) has the potential for significant growth and transformation in the coming years. Several trends and developments may shape the future of VR:

1. Hardware Improvements:
- Higher Resolution and Field of View: Advances in display technology could lead to VR headsets with higher resolutions and broader fields of view, enhancing the immersive experience.
- Lighter and More Comfortable Designs: Manufacturers may focus on creating more comfortable and lightweight VR headsets to improve the overall user experience.

2. Wireless Connectivity:
- Wireless VR: The development of robust wireless VR solutions could eliminate the need for cables, providing users with greater freedom of movement.

3. Improved Interactivity:
- Haptic Feedback and Sensory Integration: Enhanced haptic feedback and integration of other sensory inputs, such as touch and smell, could make VR experiences more realistic and engaging.

4. Content Expansion:
- Diverse Content: The availability of diverse and high-quality VR content, including games, educational experiences, and virtual social spaces, will be crucial for the widespread adoption of VR technology.
- Integration with Other Technologies: Integration with other technologies like artificial intelligence (AI) and augmented reality (AR) could open up new possibilities for interactive and dynamic VR experiences.

5. Enterprise and Industrial Applications:
- Training and Simulation: VR is likely to be increasingly used in training simulations for various industries, such as healthcare, aviation, and manufacturing, providing cost-effective and safe training environments.

6. Social VR:
- Virtual Social Spaces: The development of more immersive and interactive virtual social spaces could lead to increased adoption of VR for socializing, meetings, and collaborative work.

7. Healthcare and Therapy:
- Therapeutic Applications: VR has the potential to be used for therapeutic purposes, such as mental health treatments and physical

rehabilitation. Continued research and development in this area could result in innovative applications.

8. Education and Remote Learning:

• Virtual Classrooms: VR may play a more significant role in education, providing students with immersive learning experiences and bridging the gap between in-person and remote learning.

9. Accessibility:

• Improved Accessibility Features: Efforts to make VR more accessible to a wider audience, including people with disabilities, could contribute to its broader acceptance.

10. Regulatory Developments:

• Standards and Regulations: The establishment of industry standards and regulations may play a crucial role in ensuring the safety and quality of VR technology, fostering greater consumer trust.

11. Cost Reduction:

• Affordability: As technology advances and production scales up, the cost of VR hardware is likely to decrease, making it more accessible to a larger audience.

The evolution of VR will depend on a combination of technological advancements, market demand, and the ability of developers to create compelling and innovative experiences. It's an exciting space to watch as it continues to grow and mature.

a) Based on the information included in the generative AI response, identify a second source of information that would help you to answer your research question effectively. Use APA @ Conestoga style to list this source in the space below. Remember to consult our APA @ Conestoga website!

University of California - Santa Barbara. (2023, March 1). *The future of touch.* ScienceDaily. https://www.sciencedaily.com/releases/2023/03/230301162709.htm

b) Explain how this additional source of information would add to your understanding of the research question you developed.

This source of information goes more in-depth on the future of haptic feedback, and how it closely pairs to the future of virtual reality. For example, we are in the development of holographic haptic displays, that use arrays of ultrasound emitters to create vibrations on the skin. Which will mimic the feeling of pressure in the same way you feel your hand touch an object. In theory, a person in VR could be placed in a room surrounded by these arrays, and if they reach out to touch an object, the arrays will create the sensation of the object for them to interact with. At the current point in time, the technology can only create light sensations feeling like a puff of air. Currently diffusion has been a barrier to developing this technology, but they hope with a more research into understanding on ultrasound waves and sin, they can eventually create firmer sensations. With this kind of technology, we could expand how realistic and interactive virtual reality spaces are, and deepen our experiences with it.

c) Based on the AI response, would you make any changes to your original research question? Why or why not? If you would, what might that change include?

I would rephrase my question to look more at the methods of application for VR technology in our lives and careers. The AI had a lot of focus on the technology improvements, like becoming lighter, becoming wireless, becoming more affordable or accessible, and developing haptic feedback. I was hoping for more in depth response to how these developments can eventually be implemented in our everyday lives, workspaces, or institutions. I would have liked to see more examples of how people are using or can use the technology in their businesses, careers, and home lives.

6. Distinguish Sources of Information and Writing Produced by Generative AI
Conestoga's Academic Integrity policies prohibit students from presenting academic work for assessment if it was not produced by them.

This is one reason students should not use artificial intelligence on their assessments unless they are explicitly permitted to do so.

But this is not the only reason!

Look at the text produced by AI in response to your research question and, in the space below, explain how this response might fail to meet the expectations of an academic a research-based writing assignment at Conestoga College.

In your response, you might consider what we have learned about any or all the following:

- audience and purpose,
- tone and voice,
- organizing and developing ideas,
- using text references to support your academic writing, and
- APA @ Conestoga style guidelines.

There are a few problems with relying on AI as a source for academic works. In my personal opinion the most crucial issue is the lack of source information, as the AI cannot give an accurate account of where it has retrieved its information and opinions from. With other appropriate sources, you can trace the information to its main source, and you can see whose opinion you are currently viewing through. We have no way to confirm if the information given was from a scientific study or an opinion piece on a poorly reputable blog. Just like health information is more reputable from a Dr than a mentally unstable uncle, the sources we get our information from can greatly influence the amount of reliability we can intrust into it.

Another concern lays in how the technology itself works. It is easy for someone to assume there is a human-like artificial mind on the other end, thinking and functioning like us just much faster. This is not the case however, as the current iteration of AI is essentially a text-generator that does not fully comprehend the information given. They cannot verify their information, understand the context, or use reasoning to make connections. This leaves the technology prone to being confused or incorrect when providing a response. Since the program cannot detect when it is making an error, it will deliver the material with the same confidence regardless of accuracy. If you catch an error and correct the program, it will correct itself the best it is able, but can remain mistaken even after attempting to correct itself. Whether it is a misinterpretation of the

data on the AI's part, or a bias in the data the AI was trained on. This leaves the accuracy of the system to be unreliable, as you need to have pre-emptive knowledge to catch incorrect statements.

There are many other concerns and limitations related to the use of AI academically, and overall is not a reliable tool for research, but I find these 2 reasons to be the main disqualifiers for its use academically. The most the program can be relied on to do is identify common patterns and offer concepts or pathways to explore through more reliable sources. It can have some use as a brainstorming tool for preliminary stages, but the technology is not in a state that can be relied on for sourcing and creating academic works.