

Midterm Project

George Gordon
October 27, 2015



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ENG 2700

September 22, 2015

Technical Communication and Augmented Reality/Wearable

Technology

With evolving technology come new forms in which we will be able to communicate. What is.com defines augmented reality as the integration of digital information with live video or the user's environment in real time. As Augmented reality devices and wearable technology have the potential to enhance ourselves and our world. These devices are the future and can make technology even more integral to over lives.

Augmented reality devices can help improve our educational system. In an article from TCworld.info, the author brings up an augmented reality research project at Columbia University, in the project they had a service technician go through a repair process using augmented reality. This is where augmented reality can be highly beneficial, as it can easily show you the steps of how to go through a process instead of relying on the person's understanding of the instruction manual. It allows a person to actively participate in a process even if they are nowhere near the devices they need to practice.

Mark Billingham talks about seamless interaction in his essay, Augmented Reality in Education. He brings up a point that children do not perform as well when seated in front of separate computer screens as opposed to everyone seated around a single machine. "Augmented Reality interface students can be seated around a table and

see each other at the same time as a virtual heart floating in their midst.”

(SolomonAlexis.com) Augmented reality can bring the classroom together to work on or see their work in front of them. This, in turn would make it easier for students to interact with each other and their teacher. An online survey conducted by Macquarie University, asked participants about wearable technology in education. (Sciencedirect.com)

Participants brought up multiple methods in which wearable technology could benefit the classroom which include, recording of the class lessons, stimulation, gameification, first person views, better feedback between students and teachers and being able to free up spaces due to desks becoming unnecessary. In regards to stimulation, a participant said that students could “experience riskier scenarios and perhaps fail at them, without suffering real world consequences.” Augmented reality can provide better practice and experience in education.

Not only limited to education, augmented reality can improve the workplace as well. Applying similar tactics for augmented reality as with education can help workers or inventors throughout their day. Products like Autodesk Professional Showcase can create 3D presentations of devices a person can work on. Being able to manipulate these devices and learn about them through 3D representations will be integral to the workplace. The Microsoft HoloLens, which is a wearable piece of technology, will display holograms to bring products to life. According to their website, NASA will be able to create a 3D representation of Mars through the Mars Rover images that will allow them to “walk” on the surface Mars. TechWhirl.com has a video where they describe how marines were able to perform repairs on the field through augmented reality. They

are shown step by step how to perform repairs, what tools to use, and how to use them properly. This is where augmented reality can succeed, in showing rather than telling.

Augmented reality can even help out the average consumer thanks to new technology and websites. Take Virtual TryOn for example, it allows you to virtually try out eyewear, jewelry, or see furniture before purchasing them. No more ordering something and realizing it doesn't actually look good on you, the product is different than pictured or that it won't fit in your house. The IKEA catalogue app also brings up virtual representations of the furniture you are interested in and, using your phone or tablet, place it in your house to see where you'd place it or if it matches with your other furniture. Other types of augmented reality want to incorporate themselves into our lives to improve them, such as, Infinity AR or Google Glass. These devices could provide much more efficiency into our lives. Or for the consumer who wants to track their health, devices like the Fitbit Charge HR, can track your heart rate and workouts, monitor sleeping and exercise habits, while also functioning as a watch and caller ID. These are devices that can keep us healthy and on track even if we don't have the time to regularly check up on these things with our busy work schedules.

In education or the workplace, for the average consumer or simply for health reasons, these devices can improve the things we already do. They will focus on either doing things for us behind the scenes or by showing us how to perform tasks as opposed to being told or reading and potentially misinterpreting these instructions. This is going to be the future of technical communication.

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Augmented Reality/Wearable Technology and Technical Communication

Our technology is ever-changing and Augmented reality (AR) and wearable technology, our ways of communicating will as well. AR, as defined by Whatis.com, is the integration of digital information with live video or the user's environment in real time. These devices of technology are only going to become more integral to our lives through new advancements in different aspects of our lives.

Augmented reality could benefit our educational system, as well as, benefiting the workplace. If having multiple objects for students to work with is not viable, having virtual representations could be an alternative approach to that issue. Even recreating a single object for a whole class to work with and discuss could be an option. Mark Billingham discusses the topic of seamless interaction in his paper, *Augmented Reality in Education*, where he states that students work better within tables, as opposed to, sitting separately in front of a computer screen as it allows for group communication. He uses the example of having students seated around a table, where they are able to see each other, while having a virtual floating heart in front of them. The same could be applied within the workplace with software like Autodesk Showcase Professional 2016. This can provide interactive walkthroughs or presentations to utilize for architects, designers, or engineers. These representations could even be manipulated just like their physical counterparts as well.

Using wearable technology in schools could also bring about improvements. A survey conducted by Matt Bower and Daniel Sturman, had participants discuss the potential of wearable technology in education. They brought up being able to record classes, provide better communication between students and teachers, having a first person view, introducing gameification, having classes be more efficient and freeing up spaces. They have their cons as well, but there is no denying the improvements they can bring about. Now, if something in your workplace malfunctions, AR and wearable technology can help to rectify that situation. If no idea how to approach the situation, instead of calling someone else to come fix it for you, that could take hours or days, or attempting to learning yourself, you can use these devices to repair it yourself. It would be able to show you, step by step, how to go about the repair process instead of relying on written instructions you could misinterpret or not understand. A video on TechWhirl.com,

shows that exact process being used by Marines. By using 3D labels and arrows, the technology shows you the exact process you'll need to complete the repairs.

Going into the medical field, AR and wearable technology could be used as way for doctors to practice virtual high risk procedures without having to worry about any real consequences. Through the use of Vipaar, another surgeon could project his hands in front of you to point and guide using Google glass. In *A Survey of Augmented Reality* by Ronald Azuma, he brings up how the naked eye can see things that we cannot see through the use of Magnetic Resonance Imaging (MRI) or Computed Topography (CT) scans and through the use of AR, we could give doctors both data simultaneously. Even combining the MRI, CT scans and ultrasounds to render a virtual patient and have an "X-ray" vision into them. Other devices, such as, The Helius by Proteus Digital Health is a pill that once consumed is tracked by a companion app that allows a doctor to track if their patient is responding to therapies and taking their medication. Quell Relief is another wearable technology that can be used as a knee brace and tracks any relevant information through a companion app. These devices are changing the way doctors can communicate to each other and their patients and provide better healthcare for us.

Even the general consumer can benefit from these devices. On the topic of health, we now have fitness tracking devices like the Fitbit, that can be used by people who want to maintain a healthy lifestyle or just manage their workouts and stay fit. Smartwatches are capable of producing the same tracking features and options as well. Or take the IKEA catalog for example, this lets you virtually check out the furniture you like and "place" it in your house to see if it would be a good fit. Want to avoid an unsatisfying purchase online, virtually try on objects through TryLive. Then we have the team working to bridge the physical and digital world with InfinityAR, where an enormous amount of potential could lie.

In the end, these devices thought AR and wearable technology are evolving technical communication. In Juergen Lumera's article, *Is Augmented Reality the Future of Technical Documentation*, he talks about how with AR, it will be more about showing as opposed to telling, which is precisely what these devices are doing. They are tracking our stats, giving us new ways of interacting with objects and being able to learn through new forms of communication.

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Implications of Augmented Reality and Wearable technology in Technical Communication

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October 3rd, 2015

Introduction

Our technology is ever-changing and with the use of Augmented reality (AR) and wearable technology, our ways of communicating will as well. They being to push the integration of visual instead of literal. These devices are only going to become more integral to our lives through new advancements in different aspects of our lives.

Background of AR and Wearable Technology

According to Whatis.com, AR is the integration of digital information with live video or the user's environment in real time. AR can be traced back to 1957 with Morton Helig's Sensorama which would be used with movies. It would have allowed for a person's senses to be utilized throughout the experience, such as, blowing wind at you or vibrating your seat. Then, in 1966 professor Ivan Sutherland invented the Head Mounted Display which proved to be an important factor with AR. Until the creation of apps however, AR was mostly used in the science field due to how cumbersome the technology was and how expensive it was to own the technology to use it.

Now, Webopedia.com defines wearable technology as computer powered devices or equipment that can be worn by a user, including clothing, watches, glasses, shoes and similar items. We can date the earliest wearable technology to eyeglasses back in the year 1256, however, it wasn't until the 1960's that wearable technology was finally being produced at a constant rate. Devices like the Sony Walkman or the SEIKO UC 2000 Wrist PC began to pop up and now we have Ipods and Smartwatches. Our more modern types of wearable of technology did not appear till the 2000's. Looking towards 2016, the Oculus Rift, a virtual reality device that allows a person to move their head in a virtual space which is primarily being aimed for video gaming, is set for release.

How AR and Wearable Technology can be used in Education

Augmented reality and wearable technology have their place in our educational system, in ways that could potentially be beneficial to it. Say you don't have enough resources to fully instruct a class on a particular topic, using visual representations of them through AR could be a viable option

or alternative. Perhaps having only one but allowing the whole class to interact with it in a classroom setting as well. Mark Billinghurst brings up in *Augmented Reality in Education*, that children work better in groups as opposed to isolated with a computer screen in front of them. He proposes using AR to have a class work side by side while having a virtual floating heart in front of them which will encourage communication. AR could bring a static reading to life with a video of the piece you are reading, bringing the situation or characters to life and make it more interesting or informative. AR could even be used to provide visual instruction and eliminate the need for a manual that could potentially be misunderstood.

Moving onto wearable technology, a survey done by Matt Bower and Daniel Sturman asked participants about potential uses of these device in education. Among the responses were the ability to record classes, provide better communication between students and teachers, introducing gameification, freeing up spaces through use of digital representations. That's not to say they don't have their potential problems as well. Some participants mentioned how a lack of support for these devices or if they malfunction, could be a huge deterrent for implementing them. However, one participant even mentions that it could allow students to "experience riskier scenarios and perhaps fail at them, without suffering real world consequences." This could be used in the medical field to great effect, having students practice risky surgeries or procedures without the need for a living breathing person.

AR and Wearable Technology in the Medical Field

In *A Survey of Augmented Reality* by Ronald Azuma, he brings up how the naked eye can see things that we cannot see through the use of Magnetic Resonance Imaging (MRI) or Computed Topography (CT) scans and through the use of AR, we could give doctors both data simultaneously. Even combining the MRI, CT scans and ultrasounds to render a virtual patient and have an "X-ray" vision into them. This, in turn, allows doctors to have better methods to treat and diagnose patients. Take AccuVein for example, a handheld scanner that can highlight where the veins are in people to provide better results when it comes to injections or blood test. Or take Vipaar, a video support solution that can be used with the Google Glass, an optical head mounted display, that

allowed a surgeon to project his hands in front of another doctor to guide and support his surgery. Ways that when implemented by doctors are evolving the way our medical processes work.

Other devices, such as, Quell Relief, The Helius by Proteus Digital Health or Fitbit are changing how we take care of ourselves. Quell Relief, another wearable technology, can be used as a knee brace while it tracks any relevant information through a companion app and is charged just like a phone. The Helius by Proteus Digital Health is a pill that once consumed is tracked by a companion app that allows a doctor to track if their patient is responding to therapies and taking their medication. Finally, the Fitbit, a fitness tracking device can be used by the average person who wants to stay fit and in control of their workouts. It can track your workout schedule and monitor your heartrate or calories burned. Smartwatches are even capable of these types of tracking as well.

How AR and Wearable Technology can be used in the Workplace

How do you go about repairing a crucial piece of equipment for your job if you have no idea where to begin? AR can help rectify that situation instead of calling someone with the knowledge to show up in a few days or losing valuable time learning to do it yourself and failing at it, you can use an AR device to have you show how to do the repair process. A video from TechWhirl.com shows Marines using AR and wearable device for this exact process. Through the use of 3D arrows, labels, and cues, they were able to fix their equipment out in the field. These devices could be used from anything to repairs to showing you how to cook and they can be used in the field or at home.

Then we have software like the Autodesk Showcase Professional 2016, which can interactive walkthroughs or presentations to utilize for architects, designers, or engineers. These representations used with the software are rendered in 3D that allows for full manipulation just like their physical counterparts. Or take the Microsoft HoloLens, which uses AR and holograms to bring things to life. According to their website, NASA will be able to create a 3D representation of Mars through the Mars Rover images that will allow them to “walk” on the surface Mars.

How the Consumer can use AR and Wearable Technology

The HoloLens isn't only being used for work and educational purposes either, it is being integrated with the Xbox One to bring consumers a new level of interactivity for gaming. At E3 2015, a video game convention, the game Minecraft was utilized in their show to give people a firsthand look at how the HoloLens can bring these games to life through holograms. Nintendo is also utilizing AR in their Pokemon game for mobile devices where you would be to capture Pokemon in real life. The Oculus Rift is another wearable device being targeted for gaming in order to further immerse players in these experiences. Sony is working on their PlayStation VR as well, which will be similar to the Oculus Rift but is aimed for the PlayStation audience. Meanwhile the Nintendo 3DS and PlayStation Vita both utilize AR through cards to bring the characters displayed on them to life.

For non-gaming purposes, IKEA is using AR for their IKEA catalog app, which renders a virtual representation of the piece of furniture you want inside your home which you can then scale and resize to see if it would be a good fit in your house. TryLive.com allows you to virtually try on glasses, jewelry or look at furniture. Essentially allowing you to try these objects before purchasing and being unsatisfied with your product once it arrives. Take the Artvertiser as well, which is software that when paired with goggles, reads an advertisement in the real world and replaces it with another creator's advertisement. Allowing for anyone to create their own advertisements for products or companies and being able to see them in the real world. Then we have forms of blending reality, where we try to bridge our digital and physical worlds. Google Glass is a prime example of this but InifityAR is aiming to bring this in a bigger scale. They hope, through the use of a pair of glasses, to bring everything together. They showcase a heads up display that can bring news or weather information to you or highlight a GPS route before your very eyes and even gamifying your workout routines to make them more than rudimentary.

Conclusion

In Juergen Lumera's article, *Is Augmented Reality the Future of Technical Documentation*, he talks about how with AR, it will be more about showing as opposed to telling, which is precisely what these devices are doing. They are aiming to change the way we communicate and instead of relying on text, we must be to show everything. We can show an instruction, we can show a

video game or be “inside” one, we can have 3D representations of a human body, or we can teach by showing.

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Augmented Reality and Wearable Technology Implications in Daily Life

George Gordon
October 14th, 2015

Introduction

With the use of Augmented reality (AR) and wearable technology, our forms of communication will begin to change. By combining these two forms of technology, we can begin to push the integration of visual communication instead of literal. New advancements in technology will bring forth new ways of dealing with our jobs, schools, or daily lives.

Background of Augmented Reality and Wearable Technology

According to Whatis.com, AR is the integration of digital information with live video or the user's environment in real time. AR can be traced back to 1957 with Morton Helig's Sensorama which would have been used with movies. It would have allowed for a person to feel wind in their face or have their seat vibrate under them.

Then, in 1966 professor Ivan Sutherland invented the Head Mounted Display, an integral development for AR. Until the creation of apps, AR was mostly used in the science field due to how cumbersome the technology was and how expensive it was to own the technology to use it.

While the term Augmented Reality was coined by Professor Tom Caudell while working on a project that would integrate virtual reality into his work.

Now, Webopedia.com defines wearable technology as computer powered devices or equipment that can be worn by a user, including clothing, watches, glasses, shoes and similar items. With the earliest wearable technology being eyeglasses created back in the year 1256.

However, it wasn't until the 1960's that wearable technology was finally being produced at a constant rate with devices like the Sony Walkman or the SEIKO UC 2000 Wrist PC. Our more modern types of wearable of technology, like Ipods and smartwatches did not appear till the 2000's.

Looking towards 2016, the Oculus Rift, a virtual reality device with rotational and positional tracking, is set for release. While the Oculus has been primarily focused on gaming, the Microsoft HoloLens, which uses AR and holograms, is being aimed at gaming as well as, for more practical uses.

Augmented Reality and Wearable Technology for the Consumer

In gaming, the Microsoft HoloLens is being integrated with the Xbox One to bring consumers a new level of interactivity for gaming. At E3 2015, a video game convention, Microsoft showcased how the HoloLens would be able to bring games to life by displaying an interactive hologram of the video game, Minecraft.

Sony is working on their PlayStation VR as well, which will be similar to the Oculus Rift but is aimed for the PlayStation audience. Nintendo, a video game company, is also utilizing AR for their Pokemon game for mobile devices where you would be to capture Pokemon in real life. Meanwhile, both the PlayStation Vita and Nintendo 3DS utilize AR through cards that when used with cameras will bring the characters on them to life.

For non-gaming purposes, IKEA is using AR for their IKEA catalog app, which renders a virtual representation of the piece of furniture you want inside your home which you can then scale and resize to see if it would be a good fit in your house. And TryLive.com allows you to virtually try on glasses, jewelry or look at furniture. Both these products essentially allow you to try these objects before purchasing to avoid dissatisfaction in online purchases.

The Artvertiser is software that when paired with goggles, reads an advertisement in the real world and replaces it with another creator's advertisement. Which can allow anyone to create and display their advertisements for products or companies and being able to see them in the real world.

Then we have forms of blending reality, which aim to bridge our digital and physical worlds. Google Glass, an optical head mounted display, is a prime example of this. Equipped with a camera, touch pad, and interactive display, everything would be brought up right before your eyes.

InifityAR is aiming to do this on a bigger scale through the use of a pair of glasses, similar to that of Google Glass to bring everything together. With a heads up display that can bring news or weather information to you or highlight a GPS route before your very eyes and even gamifying your workout routines to make them more than rudimentary.

Augmented Reality and Wearable Technology in Education

Augmented reality and wearable technology have their place in our educational system as well. Say you don't have enough resources to fully instruct a class on a particular topic, using visual representations of them through AR could be an alternative solution. Or you could have a whole class sit around with one fully rendered 3D model before them.

In his article, *Augmented Reality in Education*, Mark Billinghurst discusses how children work better in groups as opposed to being isolated with a computer screen in front of them. He proposes using AR to have a class work side by side while having a virtual floating heart in front of them which will encourage communication.

AR could bring a static reading to life with a video of the piece you are reading, bringing the situation or characters to life and make it more interesting or informative. AR could even be used to provide visual instruction and eliminate the need for a manual that could potentially be misunderstood.

Moving onto wearable technology, a survey done by Matt Bower and Daniel Sturman asked participants about potential uses of these device in education. Among the responses were the ability to record classes, providing better communication between students and teachers, introducing gameification, and it would allow schools to free up space through use of digital representations.

That's not to say they don't have their potential problems as well. Some participants mentioned how these devices could serve as a form of distraction or encourage cheating, while also touching upon privacy concerns, as examples for being huge deterrents for implementing them in schools.

However, one participant mentions that it could allow students to "experience riskier scenarios and perhaps fail at them, without suffering real world consequences." This could be used in the medical field to great effect, having students practice risky surgeries or procedures without the need for a living breathing person.

Augmented Reality and Wearable Technology in the Medical Field

Ronald Azuma in his, *A survey of Augmented Reality*, brings up how the naked eye can see things that we cannot see through the use of Magnetic Resonance Imaging (MRI) or Computed Topography (CT) scans. Through the use of AR, however, we could give doctors both data simultaneously. Even potentially giving doctors “X- ray” vision by combining the MRI, CT scans and ultrasounds to render a virtual patient. Which would allow doctors to have better methods to treat and diagnose patients.

Take AccuVein for example, a handheld scanner that can highlight where a person’s veins are to provide nurses with better accuracy when it comes to injections or blood tests. Or VA-ST, a sensor made for those who legally blind and can help them recognize faces or drive.

Vipaar, a video support solution that can be used with the Google Glass that can allow a surgeon to project his hands in front of another surgeon to provide guidance and support. All these are ways that when implemented by doctors are evolving the way our medical processes work.

Other devices, such as, Quell Relief, The Helius by Proteus Digital Health or Fitbit are changing how we can take care of ourselves. The Quell Relief, another wearable technology, can be used as a knee brace while it tracks any relevant information through a companion app and is charged just like a phone.

The Helius by Proteus Digital Health is a pill that once consumed is tracked by a companion app that allows a doctor to track if their patient is responding to therapies and taking their medication.

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All these are methods when implemented by doctors or ourselves are evolving the way our medical processes work.

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Then we have software like the Autodesk Showcase Professional 2016, which can interactive walkthroughs or presentations to utilize for architects, designers, or engineers. These representations used with the software are rendered in 3D that allows for full manipulation just like their physical counterparts.

Or take the Microsoft HoloLens, which aims to be used in the workplace and for educational purposes as well as gaming. According to their website, NASA will be able to create a 3D representation of Mars through the Mars Rover images that will allow them to “walk” on the surface Mars.

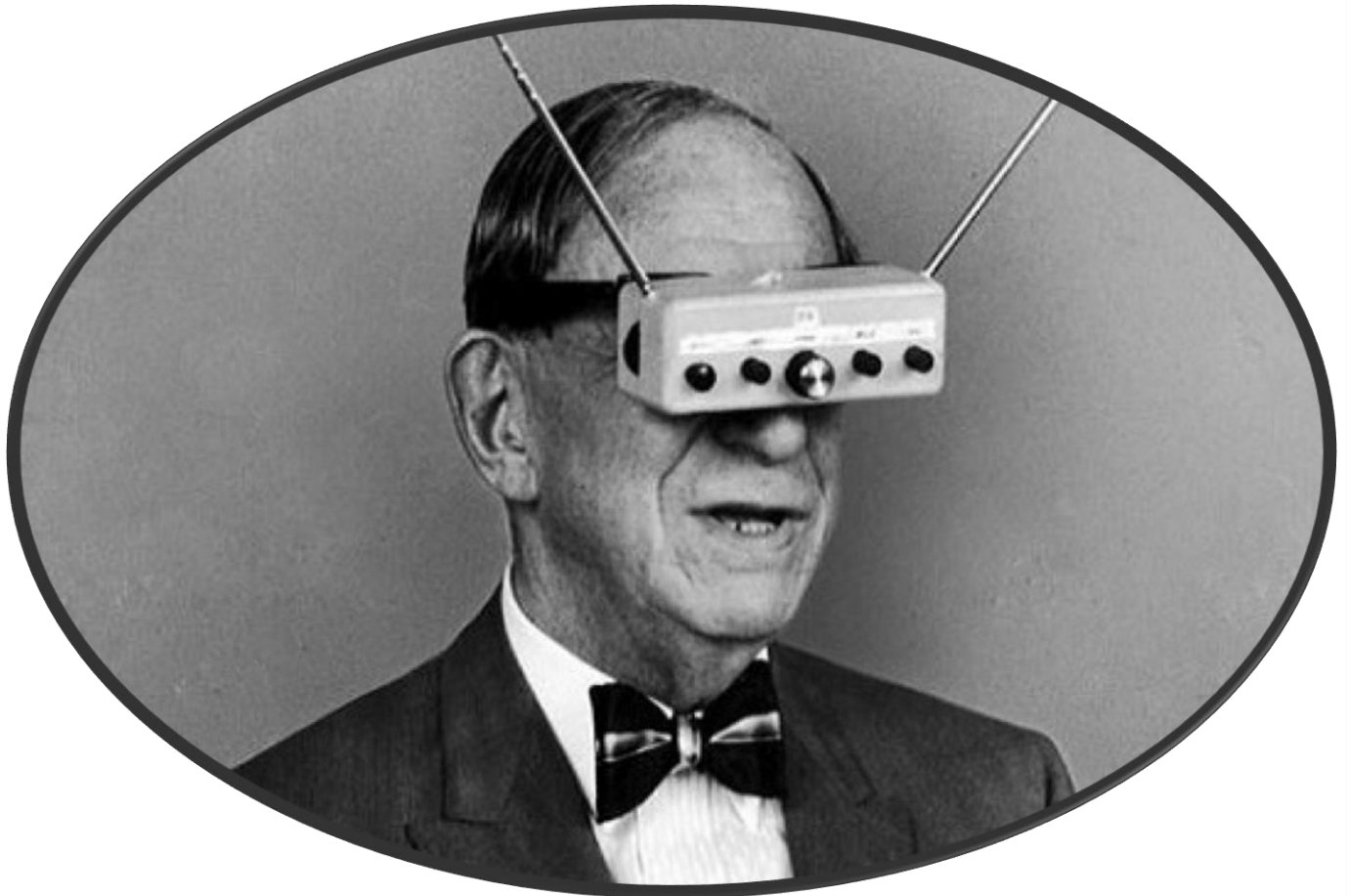
Conclusion

In Juergen Lumera’s article, *Is Augmented Reality the Future of Technical Documentation*, he talks about how AR will be more about showing as opposed to telling. They are aiming to change the way we communicate and instead of relying on text, we must be able to show everything. These devices have a justified use in our world, it’s just up to us to find the methods of incorporating them.

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Augmented Reality and Wearable Technology Implications in Daily Life



By: George Gordon
October 21, 2015

A New Approach to Communication

Our technology is evolving to the point where we are able to incorporate advanced pieces of technology to help our daily needs and lives. These devices have a justified use in our world, it's just up to us to find their applicable use in our world.

In Juergen Lumera's article, *Is Augmented Reality the Future of Technical Documentation*, he talks about how Augmented Reality (AR) will be more about showing as opposed to telling. With wearable technology only enhancing this idea, through the uses of our phones, smartwatches, or computers.



A Brief History of Augmented Reality and Wearable Technology

According to Whatis.com, AR is the integration of digital information with live video or the user's environment in real time. AR can be traced back to 1957 with Morton Helig's Sensorama which would have been used with movies. It would have allowed for a person to feel wind in their face or have their seat vibrate under them.



Then, in 1966 professor Ivan Sutherland invented the Head Mounted Display, an integral development for AR.

Until the creation of apps, AR was mostly used in the science field due to how cumbersome the technology was and how expensive it was to own the technology to use it.

While the term Augmented Reality was coined by Professor Tom Caudell while working on a project that would integrate virtual reality into his work.

Now, Webopedia.com defines wearable technology as computer powered devices or equipment that can be worn by a user, including clothing, watches, glasses, shoes and similar items. With the earliest wearable technology being eyeglasses created back in the year 1256.

However, it wasn't until the 1960's that wearable technology was finally being produced at a constant rate with devices like the Sony Walkman or the SEIKO UC 2000 Wrist PC. Our more modern types of wearable of technology, like Ipods and smartwatches did not appear till the 2000's.

Looking towards 2016, the Oculus Rift, a virtual reality device with rotational and positional tracking, is set for release. While the Oculus has been primarily focused on gaming, the Microsoft HoloLens, which uses AR and holograms, is being aimed at gaming as well as, for more practical uses.

Implications for the Consumer

In gaming, the Microsoft HoloLens is being integrated with the Xbox One to bring consumers a new level of interactivity for gaming. At E3 2015, a video game convention, Microsoft showcased how the HoloLens would be able to bring games to life by displaying an interactive hologram of the video game, Minecraft.



Nintendo, a video game company, is also utilizing AR for a Pokemon game being made for mobile devices where you would be to capture Pokemon in real life. Meanwhile, both the PlayStation Vita and Nintendo 3DS utilize AR through cards that when used with cameras will bring the characters on them to life.

For non-gaming purposes, we have software that allow you to test objects before purchasing to avoid dissatisfaction in online purchases.

IKEA is using AR for their IKEA catalog app. This renders a virtual representation of the piece of furniture you want inside your home which you can then scale and resize to see if it would be a good fit in your house.

While TryLive.com allows you to virtually try on glasses, jewelry or look at furniture through the use of your computer and camera.

Now The Artvertiser is software pairs with goggles and reads an advertisement in the real world which it then replaces with another creator's advertisement. This allows anyone to create and display their advertisements for products or companies and have others see them in the real world.

Then we have forms of blending reality, which aim to bridge our digital and physical worlds. Google Glass, an optical head mounted display, is a prime example of this. Equipped with a camera, touch pad, and interactive display, everything would be brought up right before your eyes.

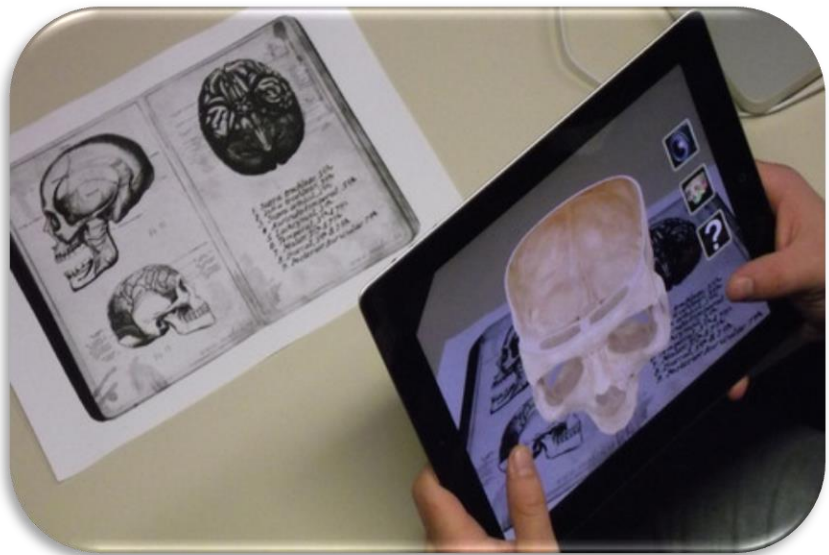
InifityAR is aiming to do this on a bigger scale through glasses similar to that of Google Glass. With a heads up display that can bring news or weather information to you or highlight a GPS route before your very eyes and even gamifying your workout routines to make them more than rudimentary.

Implications in Education

Augmented reality and wearable technology have their place in our educational system as well. Say you don't have enough resources to fully instruct a class on a particular topic, using visual representations of them through AR could be an alternative solution. Or you could have a whole class sit around with one fully rendered 3D model before them.

In his article, *Augmented Reality in Education*, Mark Billinghurst discusses how children work better in groups as opposed to being isolated with a computer screen in front of them. He proposes using AR to have a class work side by side while having a virtual floating heart in front of them which will encourage communication.

AR could even bring a static reading to life through video or 3D representations. Bringing the material or characters to life and making it more interesting or informative. AR could even be used to provide visual instruction and eliminate the need for a manual that could potentially be misunderstood.



According to *The Studierstube Augmented Reality Project*, the Vienna University of Technology created a collaborative AR system which allowed multiple people to enter a virtual space that could be filled three dimensional data. Combined with head tracking devices, their Personal Interaction Panel (PIP), a prop device which could have data overlaid on it, provided a way for users to see and hold the representations being placed before him. The PIP also would allow for gestures such as writing and drawing to be made, manipulation of objects in three dimensions and provide animations or live and still images to be displayed.

Through an application called Construct3D, they were even able to teach students mathematics and geometry education through the Studierstube.

Moving onto wearable technology, a survey done by Matt Bower and Daniel Sturman asked participants about potential uses of these devices in education. Among the responses were the ability to record classes, providing better communication between students and teachers, introducing gameification, and it would allow schools to free up space through use of digital representations.



However, one participant mentions that it could allow students to “experience riskier scenarios and perhaps fail at them, without suffering real world consequences.” This could be used in the medical field to great effect, having students practice risky surgeries or procedures without the need for a living breathing person.

Implications in the Medical Field

Just take a look at Vipaar, a video support solution that can be utilized with Google Glass, that allowed a surgeon to project his hands in front of another surgeon to provide guidance and support.

While AccuVein is a handheld scanner that can highlight where a person’s veins are to provide nurses with better accuracy when it comes to injections or blood tests. Or VA-ST, a sensor made for those who legally blind and can help them recognize faces or drive.

In *A survey of Augmented Reality*, Ronald Azuma brings up how the naked eye can see things that we cannot see through the use of Magnetic Resonance Imaging (MRI) or Computed Topography (CT) scans. Through the use of AR, however, we could give doctors both data simultaneously. Even potentially giving doctors “X-ray” vision by combining the MRI, CT scans and ultrasounds to render a virtual patient. Which would allow doctors to have better methods to treat and diagnose patients.

Other devices, such as, Quell Relief, The Helius by Proteus Digital Health or Fitbit are changing how we can take care of ourselves. The Quell Relief, a piece wearable technology,

can be used as a knee brace while it tracks any relevant information through a companion app and is charged just like a phone.

The Heliuss by Proteus Digital Health is a pill that once consumed is tracked by a companion app that allows a doctor to track if their patient is responding to therapies and taking their medication. A doctor can even be alerted to when a patient is unwell and check up on them through the real time tracking.

Implications in the Workplace

How do you go about repairing a crucial piece of equipment for your job if you have no idea where to begin? AR can help rectify that situation. Instead of calling someone else, who may show up in a few days or longer and losing valuable time. AR can teach you do it yourself through a visual means instead of reading a manual and potentially misinterpreting it.

A video on TechWhirl.com showcases Marines using AR and wearable device for this exact process. Through the use of 3D arrows, labels, and cues, they were able to fix their equipment out in the field. These devices could be used from anything to repairs to showing

Finally, Fitbit, a fitness tracking device, can be used by the average person who wants to stay fit and in control of their workouts. It can track your workout schedule and monitor your heartrate or calories burned. Smartwatches are even capable of these types of tracking as well.

All these are methods that when implemented by doctors or ourselves are evolving the way our medical processes work.

you how to cook and they can be used in the field or at home.

Since tablets already come equipped with a camera they will be ideal to use with AR. Thanks to the numerous amount of apps and developers working on AR applications, tablets will be a simply way of incorporating AR in the workplace. With the automotive industry already taking full advantage of this.

With software like Autodesk Showcase Professional 2016, interactive walkthroughs or presentations can be made for use by architects, designers or engineers. These representations are rendered in 3D and allow for full manipulation just like their physical counterparts.

The Microsoft HoloLens, which is not only aimed to be used for gaming but to be used in the workplace. It will allow for the use of HoloNotes in Skype so your colleagues can see the exact work you are doing and provide feedback. According to their website, NASA will be able to create a 3D representation of Mars through the Mars Rover images that will allow them to “walk” on the surface Mars.



Conclusion

With the use of AR and wearable technology, our forms of communication are changing. By combining these two forms of technology, we can begin to incorporate visual communication instead of literal. These devices have a justified use in our world, it's just up to us to find their applicable use in our world. The way in which we interact with our world and communicate with each other is undergoing a change that will last for generations to come.

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Applications for Augmented Reality and Wearable Technology in Daily Life



By: George Gordon

October 24, 2015

A New Approach to Communication

Juergen Lumera discusses how augmented reality (AR) will focus on showing as opposed to telling in his article, *Is Augmented Reality the Future of Technical Documentation*. Wearable technology will only enhance this idea, through the use of our phones, smartwatches, or computers.

Our technology has evolving to the point where we are able to incorporate advanced pieces of technology into our daily lives. These devices have a justified use in our world, it's just up to us to find their applicable use in our world.

A Brief History of Augmented Reality and Wearable Technology

According to Whatis.com, AR is the integration of digital information with live video of the user's environment in real time.

AR can be traced back to Morton Helig's Sensorama, developed in 1957, which would have been used with movies. It would have allowed for a person to feel wind in their face or have their seat vibrate under them.

Then, in the year 1966 professor Ivan Sutherland invented the Head Mounted Display, which at the time was a device too heavy for a human head to wear but, an integral development for AR.

Until the creation of apps, however, AR was mostly used for scientific purposes. Due to the fact that the



technology was cumbersome and much too expensive for the average consumer.

While working in Boeing's Computer Services' Adaptive Neural Systems Research and Development project in Seattle, Professor Tom Caudell coined the term "Augmented Reality."

Now, Webopedia.com defines wearable technology as computer powered devices or equipment that can be worn by a user, including clothing, watches, glasses, shoes and similar items. With the earliest wearable technology being traced back to eyeglasses that were created in the year 1256.

However, it wasn't until the 1960's that wearable technology was finally being produced at a constant rate with devices like the Sony Walkman or the SEIKO UC 2000 Wrist PC. However, our more modern types of wearable technology, such as, iPods, Nano or otherwise, and smartwatches did not appear till the 2000's.

Looking towards 2016, the Oculus Rift, a virtual reality device with rotational and positional tracking, is set for release. While the Oculus Rift has been primarily focused on gaming, the Microsoft HoloLens, which uses AR and holograms, is being aimed for more

practical uses in education and the workplace, as well as gaming.

Implications in the Workplace

So, how do you go about repairing a crucial piece of equipment for your job if you have no idea where to begin? AR can help rectify that situation. Instead of calling someone else, who may or may not show up and lose valuable time, AR can teach you do it yourself through a visual means instead of potentially misinterpreting a manual.

A video on TechWhirl.com showcases Marines using AR and a wearable device for this exact process. Through the use of 3D arrows, labels, and cues, they were able to fix their equipment out in the field. These devices could be used in the field or at home, from repairs to teaching you how to cook.

Now, according to *The Studierstube Augmented Reality Project*, the Vienna University of Technology created a collaborative AR system that allowed multiple people to enter a virtual space that could be filled three dimensional data. Equipped with head tracking devices and a Personal Interaction

Panel (PIP), a prop device which could have data overlaid on it, allowed users to see and hold the representations being placed before them.

The PIP also would allow for gestures such as writing and drawing to be made. With full manipulation of objects, as well as, providing animations of live and still images to be displayed.

Software like Autodesk Showcase Professional 2016, can allow designers, architects and engineers to create interactive presentations of their work. These representations are rendered in 3D and allow for full manipulation just like their physical counterparts.

Since tablets already come equipped with a camera they will be ideal to use with AR. Thanks to the numerous amount of apps and developers working on AR applications, tablets will

Implications in Education

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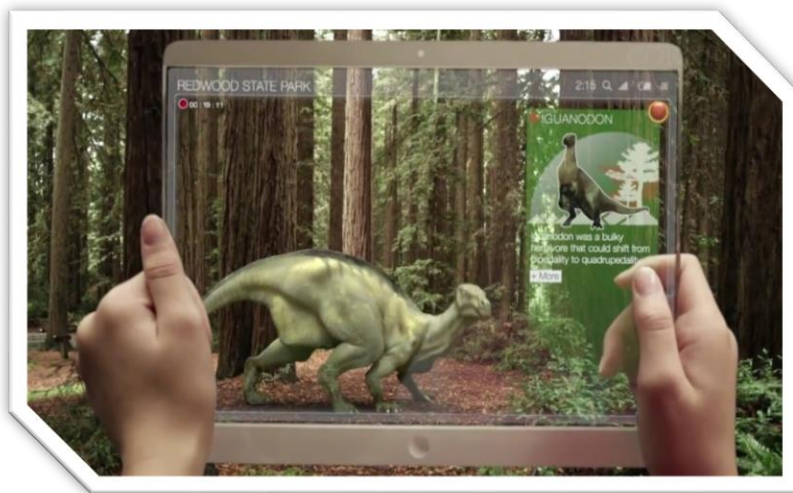


a whole class sit around with one fully rendered 3D model before them.

In the article, *Augmented Reality in Education*, Mark Billingham discusses how children work better in groups as opposed to isolated in front of

computer screen. He proposes using AR to have a class work together while having a virtual floating heart in front of them to encourage communication.

AR could even bring a static reading to life through the use of video or 3D representations. Bringing the material to life and allowing for full exploration or alteration can be more interesting and informative. AR can even provide visual instructions and eliminate the need for manuals that could potentially be misunderstood.



The Studierstube project, through an application called Construct3D, was even able to teach students mathematics and geometry education, by allowing students to see actual three dimensional shapes as opposed to 2D drawings on a piece of paper.

Moving onto wearable technology, a survey done by Matt Bower and Daniel Sturman asked participants about potential uses of these devices in education. Among the responses were the ability to record classes, providing better communication between students and teachers, introducing gameification, and allowing schools to free up space through use of digital representations.

However, one participant mentions that it could allow students to “experience riskier scenarios and perhaps fail at them, without suffering real world consequences.”

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Implications in the Medical Field

Just take a look at Vipaar, a video support solution that can be utilized with Google Glass, an optical head mounted display, that allowed a surgeon to project his hands in front of another surgeon to provide guidance and support during a live surgery.

Then we have AccuVein, a handheld scanner that can highlight where a person's veins are to provide nurses with better accuracy when it comes to injections or blood tests. Or the VA-ST, a sensor made for people who are legally blind that can help them recognize faces and drive.

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Other devices, such as, Quell Relief, The Helius by Proteus Digital Health or Fitbit are changing how we can take care of ourselves. The Quell Relief is a piece of wearable technology that can be used as a knee brace. Meanwhile it will track any relevant information through a companion app and is charged just like a phone.

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These are devices that when implemented by doctors or ourselves are evolving the way our medical processes work.

Implications for the Consumer

Now for gaming, the Microsoft HoloLens is being integrated with the Xbox One to bring consumers a whole new level of interactivity. At E3 2015, an annual video game convention, Microsoft showcased how the HoloLens would be able to bring games to life by displaying an interactive hologram of the video game, Minecraft.

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the Nintendo 3DS and PlayStation Vita utilize AR through cards that when used in conjunction with their cameras will bring the characters on them to life.



For non-gaming purposes, we have software that will allow you to test objects before purchasing to avoid dissatisfaction with online purchases.

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Then we have forms of blending reality, which aim to bridge our digital and physical worlds. Google Glass is a prime example of this. Equipped with a camera, touch pad, and interactive

display, everything would be brought up right before your eyes.

With InifityAR aiming to do this at a larger scale through glasses similar to that of Google Glass. These glasses would encapsulate your entire life with heads up display that can bring news or weather information to you or highlight a GPS route before your very eyes. Even gamifying your workout routines to make them more than rudimentary.

The Future Relies on Us

These devices have a justified use in our world, it's just up to us to find their applicable use in our world. With the use of AR and wearable technology, our forms of communication are changing.

By combining these two forms of technology, we can focus on visual communication instead of only literary communication. The way in which we interact with our world and communicate with each other is undergoing a change that will last for generations to come.

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Google - Trends in technical communication

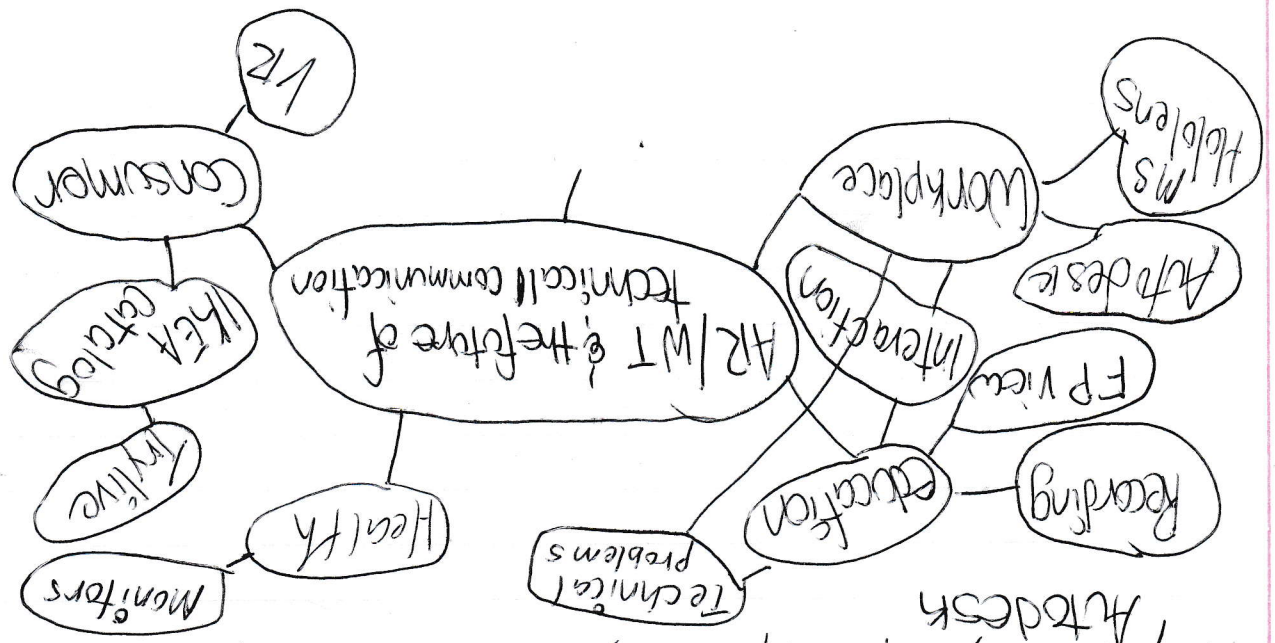
Augmented Reality / Wearable technology

AR - Enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device

WT - Technology devices that can be worn by a consumer & often include tracking information relating to health and fitness. Other devices have small motion sensors to take photos & sync with mobile devices.

Smart watch, I watch, Google Glass.
Health monitors, Pedometers, Activity trackers,
Virtual reality headsets.

Try live, Infinity AR, Artvertiser, IKEA catalog, Autodesk



Education - AR is used to show how to repair machines
Students can be brought together as opposed
to separately

"Experience riskier situations & fail without consequence."
Gameification.

Workplace - Autodesk - Provides easy to use presentation &
Design exploration tools.

Microsoft HoloLens - Holograms, bring products to life,
3D models, "walk" on the surface of Mars.

New form of instructing.

Consumer - Virtual try on - Allows you to try on eyewear, jewelry
before buying online.

IHEA catalog - Furniture can be placed as a virtual
version to see if it would fit.

VR for gaming. Google Glass.

Health - Fitness tracking. Heart monitors.

Smartwatches. Helius. Quell relief. "X-ray
vision" for doctors.

AR & WT

Workplace

How can these devices ~~be more effective~~ improve these fields?

AR & WT & Education

AR & WT & Medical systems

AR & WT & Health

Could these devices help us stay healthy & improve medical systems?

AR & WT & The Consumer

How can a consumer benefit from these devices?

Corner.

Page 1 - Title - Middle Running head.

Name & affiliation of intended reader

Author - Affiliation

Date.

Pg 2 - Abstract - Write last.

Pg 3 - Report. Introduction
Sub headings & headings

Pg Numbers.

Final pg - References, citation.

Include medical info. Anything related to edu.

AR in education

As well as medical field.

Intro

History of AR

AR in education

AR in the Workplace
AR for the consumer.

Written last.

Conclusion

idea, infinity AR
Google glass, smart watches
Fitness trackers.

Headings -

Cons of AR & ?

Spying & cons of Education.