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Google Glass and its Role in Modern Education

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Abstracts

Google has developed a wearable computer optical head-mounted display research and development ubiquitous computer. Glass displays information in a natural language gadget with an (OHMD) the project Project Glass with the intension of producing a mass-market hands-free format which can interact with the Internet through voice commands. The Google Glass will have the combined features of virtual reality and augmented reality. It works on Google's Android Operating System. It also uses other technologies such as4G, EyeTap, Smart Clothing, Smart Grid. Google Glass is a futuristic we've seen in recent times. It will prove as a useful technology for all kinds of people including handicapped/disabled .This new Technology increases the flexibility of delivery of education so the learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning.

Keywords: Google glass.

Introduction

Innovations in education has always been a little stagnant, while we see new inventions and developments in all other fields, educational innovations are very less. People have always stuck with the known, tried, tested and traditional methods in case of education. But recently, we've seen a boom in this field too. More and more people are now paying attention to the almost obsolete methods of teaching and striving to make some development in the educational system.

What is Google Glass?

Google Glass is a small device tacked onto a pair of glasses. Google Glass lets you record what you're seeing, view a heads-up display of information and has a touch pad on the right side of the glasses. That touch screen is one of the ways you control your pair of Glass. The other way is by verbal commands like "OK Glass" and that sort of thing. Google has always been known for innovations in almost every area they could get their hands onto, and it is launching its flagship product 'Google Glass'. Google Glass is touted as the next big thing in portable technology. Poised as an eyewear and doing a plethora of things which don't require any taps or navigation, it responds instead to voice commands, taking pictures with a wink, taking commands for search, share content, video recording, detect objects in front of you and look up related information like directions or maps. etc. The possibilities are endless though among all the possible consumers of Google Glass . The device has the potential to bring exciting new possibilities to teachers and students alike.

Project glass

Project Glass research and development Google augmented reality head-mounted display Google X Lab. The Google X Lab works on futuristic technologies. smart phone natural language Steve Mann's Eye Tap, operating system used in the glass will be Google's Android. is a program by to develop an (HMD). It is a part of the The purpose of Project Glass products is the hands-free displaying of information currently available for most users, and allowing interaction with the Internet through voice commands. Its functionality and physical appearance has been compared to which was also referred to as "Glass". The operating system used in the glass will be Google's Android.

Virtual reality (VR)

Virtual reality computer-simulated telepresence telexistence virtual artifact applies to environments that can simulate physical presence in places in the real world and in imaginary worlds. It connects remote communication environments which provide virtual presence of users with the concepts such as and or (VR)

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Augmented reality (AR):
Augmented reality is a view of a physical, real-world environment which is live, direct or indirect. It is related to a general concept called mediated reality, which means a view of reality is modified by a computer. This technology functions by enhancing user's current perception of reality.

Technologies used

Wearable computing:
Wearable computers technology are the electronic devices that are worn by the bearer under, with or on top of clothing. This has been developed for general or special purpose information technologies and media development. Wearable computers are useful for applications that require more complex computational support than just hardware coded logics.

The main feature of a wearable computer is consistency. It provides a constant interaction prosthetic. Therefore, it can be an extension of the user's mind and/or body. between the computer and user, which means there is no need to turn the device on or off. Also it has the ability to multitask. User can incorporate these devices to act like a prosthetic. Therefore, it can be an extension of the user's mind and/or body. **A**

Ambient intelligence: Ambient Intelligence (AmI) creates electronic environments that are sensitive and responsive to the presence of people. Devices work in harmony to support people in carrying out their everyday life activities and tasks in easy, natural way in ambient intelligence. People use information and intelligence which is hidden in the network connecting these devices

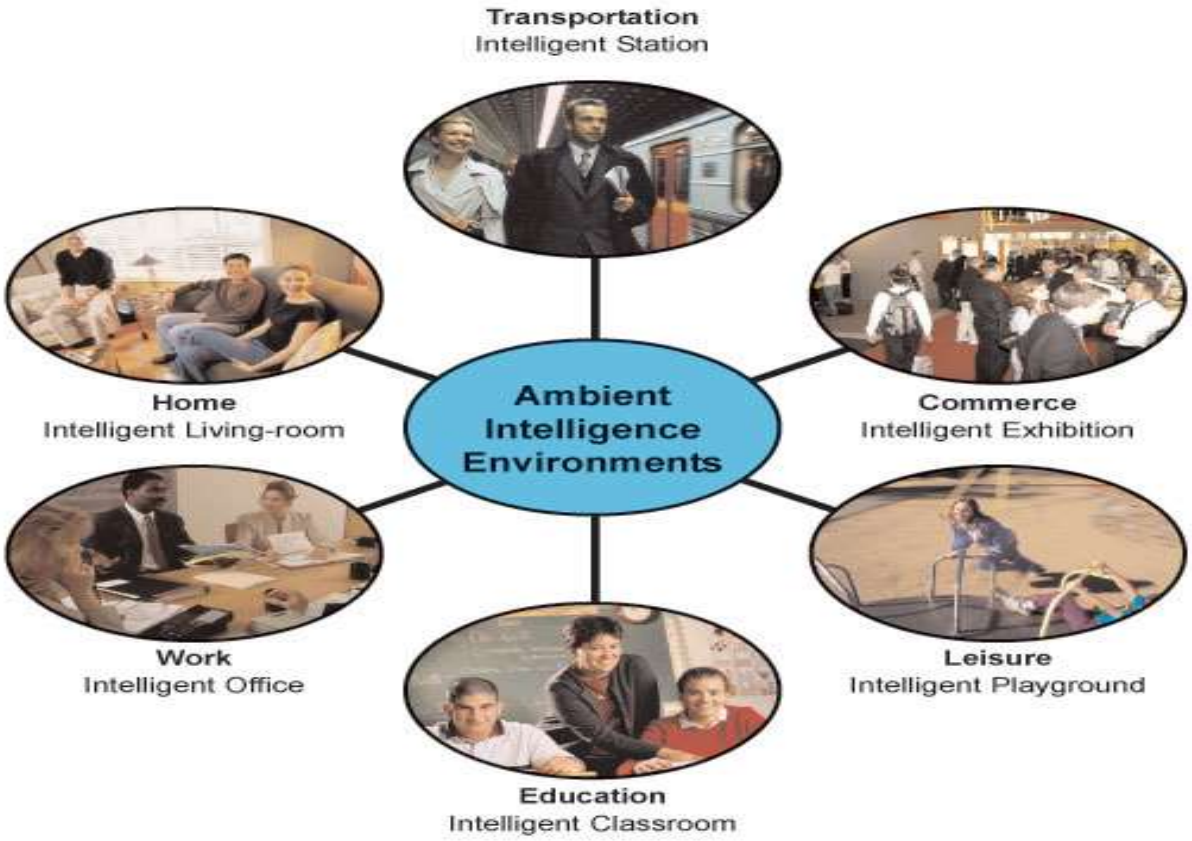

Figure Ambient Intelligence Environments

As these devices have grown smaller, also more connected and more integrated into our environment, the technology disappears into our surroundings until only the user interface remains perceivable by users.

Smart clothing:
Smart clothing is the new generation of clothing. It is a combined result of new fabric technology and digital technology, i.e. the clothing is made with new signal-transfer fabric technology installed with digital devices

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Figure Smart Clothing

This smart clothing is still under development so, many problems have occurred due to the absence of the standardization of technology. However, there are some techniques to show how to approach standardization. It will be valuable for developing smart clothing technology and standardization in the future

Eye tap technology:

Eye as well as a display to show a on the original scene available to the eye. the user's eye operates as both a monitor and a camera. For this device, Eye Tap eye camera computer generated imagery is a device that is worn in front of the and it acts as a to record the scene available to the

Figure : Eye Tap Technology

Eye Tap is a hard technology to categorize under the three main headers for wearable computing (Constancy, Augmentation and Mediation) for while it is in theory a constancy technology in nature it also has the ability to augment and mediate the reality the user perceives.

Smart Grid Technology:

An electrical grid communication technology which uses to gather and act on information, such as information about the behaviors of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity is called as smart grid.

4G Technology 4G Ultra-broadband USB wireless modems, also to smart phones and other mobile devices. is the fourth generation of mobile communication technology. internet access is provided by a 4G system, for example to laptops with USB wireless modems, also to smart phones and other mobile devices.

Android Operating System:

Android Linux-based operating system Google.Google has made this operating system open source Android is is a for mobile devices based on Linux. It is developed by open source and its code is released under the Apache License.

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Figure Android Operating System

Apparently there were approximately 700,000 apps made available for Android in October 2012 and approximately 25 billion was the number of applications downloaded from Google Play which is Android's primary app store

Design

Video Display:

Google Glass has small video display which is used to display hands free information in pop up form.

Figure Video display of Google Glass

Camera:

It also has the front facing 5 megapixel video camera which helps to take photos and videos in a glimpse

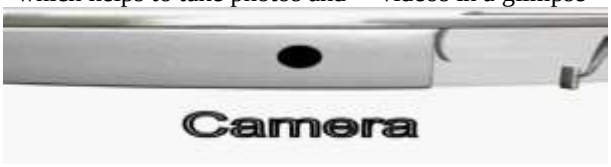

Figure: Camera of Google Glass

Speaker:

Google glass is designed to be hands free wearable device which can be used to make or receive calls. Therefore, a speaker is designed by the ear for that.

Figure Speaker of Google Glass

Button:

A button is given at one side of the frame which helps the glass to work with the physical touch input

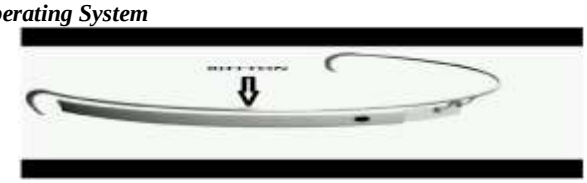

Figure Button of Google Glass

Microphone:

A microphone is provided take the voice commands of the user. It can also be used for telephonic communications.

Analysis of problem

Nowadays, most of people have a smartphone, a tablet, a laptop, or other device. So it can be said that the web is a powerful tool in society for many uses such as informative, social, as well as entertaining. Therefore, with the introduction of Google Glass, a new idea of internet usage has arrived. While opponents of this revolutionary product are giving reasons such a privacy concerns as well as social faux pass, the truth is that these glasses are quite beneficial to the society in numerous ways, including public safety, social sharing, innovative educational as well as research methodologies, and improved communication.

The public can become an important factor in reducing crimes with the use of Google Glass. Glass is fast and easy because it is hands free.. If someone becomes a witness to a crime or is about to become a victim of a crime, a quick activation of Google Glass can launch the camera and provide assurance that the culprit will be held responsible. Take 26/11 attack, for example. The case of 26/11 would have been solved faster if someone had been wearing Google Glasses. Videowould have been captured of the terrorists placing the bomb or implicating themselves in some other way. Thus, the terror of people, afterwards, could have been decreased. Also, it can be a very helpful product for medical students. The senior doctors can wear glass during an operation and he whole procedure can be watched by students outside. This is recently implemented by a Doctor in Chennai. In terms of increased public safety, Google's new product can be a revolutionary savior.

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As with any new technology, there are bugs to be worked out and changes to be made. People's privacy will be an issue, but Google Glass is definitely not dangerous and harmful to society. As a fast speed, forward moving culture, we can get a lot of benefits from such a futuristic product

Google Glass will communicate with other mobile phones via Wi-Fi or Bluetooth and display contents on the video screen and respond to the voice commands of the user. The video camera is sensible to the environment and it recognizes objects and people around. Most of the working of the Glass depends on user's voice commands.

Working:

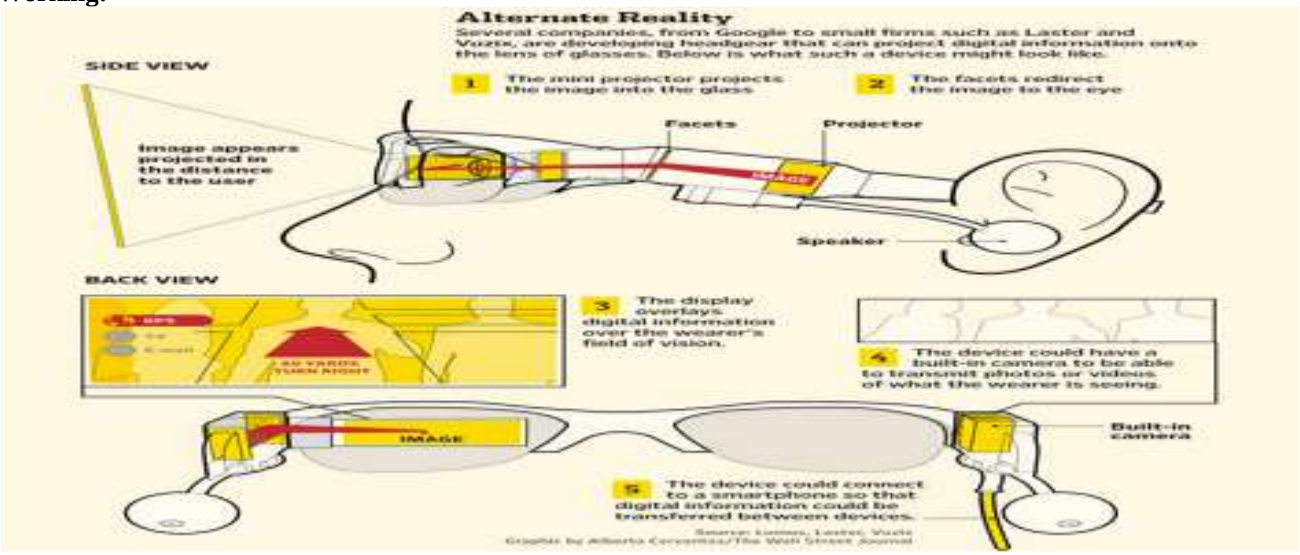

Figure : Overall working of Google glass

Google Glass has the basic features of any computer, such as a CPU, also sensors like GPS, speakers, microphone and battery, a tiny projector and a prism that directs the light to your retina. All components are neatly embedded in its frame. Most of the processing will actually take place in the cloud so that the device will be as light as possible, also a good mobile broadband signal is essential

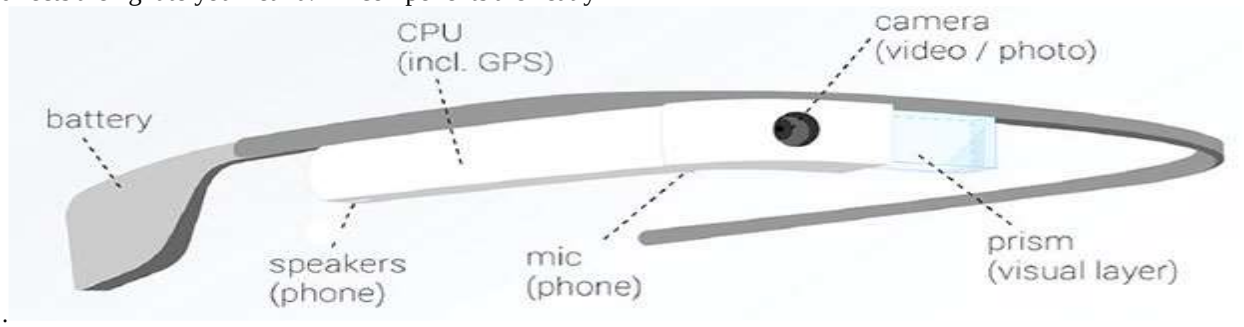

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Figure Components of Google Glass

The image below shows hoethe projector and prism in the Google Glass work together. Basically, Google Glass is just a tiny projector connected to a pair of glasses having frames with some tiny computing components.

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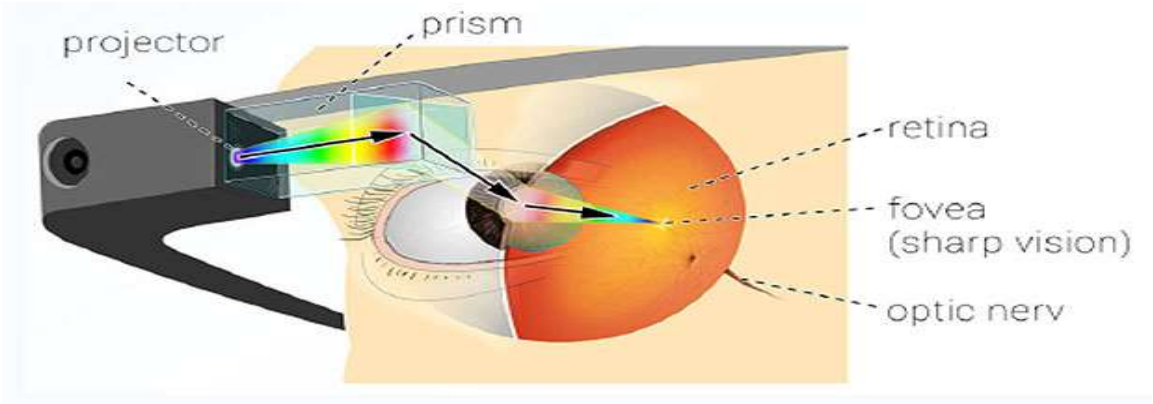

Figure Projector and Prism Working Together

The image, in spite of being super duper close to your peepers, it is bright and clear. And it is slightly transparent so you can place it right in front of your eyes comfortably.

Voice commands

The following table shows multiple voice commands which can be used while handling Google Glas

:-

FEATURE	VOICE ACTIVATION TEXT
Record video	"ok, glass, record a video."
Take picture	"ok, glass, take a picture."
Use Google Now	"ok, glass, [question]."
Start Google+ hangout	"ok, glass, hang out with [person/circle]."
Search	"ok, glass, google [search query]."
Search photos	"ok, glass, google photos of [search query]."
Translate	"ok, glass, say [text] in [language]."
Give directions	"ok, glass, give directions to [place]."
Send message	"ok, glass, send a message to [name]." "ok, glass, send [name] that [message]." "ok, glass, send [message] to [name]."
Display weather	none/automatically (Google Now) "ok, glass, how is the weather in [location]?" "ok, glass, do I need an umbrella today?"
Give flight details	none/automatically (Google Now) "ok, glass, when does flight [flight number] depart from [airport]?"

Table : Voice Commands Used for Google Glass

Benefits and limitations

Benefits:

- Easy to wear and use.
- Google glass responsive and sensitive to presence of people.
- It provides fast access of maps, videos, chats, documents and much more.
- It is a new trend for fashion lovers within an innovative technology
- Being a spectacle based computer, it resides directly on your eyes so that you don't need to keep it in your pouch or pocket.
- It is a useful technology for handicapped and disabled people.

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Limitations

- It can be easily broken or damaged. Though Google is trying to make it as modest as possible, it is extremely breakable.
- Glass shows data in front of user's eyes so it will be a tough experience for him/her because the/she will focus on data and will possibly miss the surroundings.
- Users wearing spectacles won't be able to wear Glass.
- Privacy of people may be violated with Glass.

Google glass in education

Google Glass has the potential to bring new possibilities to educators and students. Probably, Google Glass is a new educational tool that allows using actions, such as "Search", "Take a picture", "Record a video", "Translate" and other for integrating into teaching and learning activities. Successful implementation of new technology in education depends on many circumstances. We need to understand how Google Glass can change teaching and learning. Google Glass will allow the student / teacher to stay connected to an interactive environment featuring online tools all the time. This could pave way to a leap into the future of educational system.

- Teachers as well as students can refer to topics related to their studies on the go. No fiddling through phones in the middle of the lecture.
- Students can record their lectures in real-time for future reference. The time saved on scribbling notes could be remarkable.
- Google Glass can help students to create visually rich presentations. Students can shoot relevant videos and images with a wink. The same can be integrated onto their presentations via Google docs.
- Learning new languages and speaking them can be done on the go with Glass coupled with Google's own Google Translator. Google Glass will be able to present text based translations in real-time.
- Teachers can use Google glass coupled with facial recognition to take attendance and can be used to generate Student Information System. Just by looking at the student you will get access to his/her student records with details of academic and non-academic performance, attendance etc. Creating students reports, schedules and class timings for students is only the tip of the iceberg.
- Distance learning can be made a lot easier than before with Google Glass. Webinars and such can be streamed directly onto your Glass than your smart phone or laptop so that it is easy to be accessed anywhere, anytime.
- This Glass can be used to set timetables for students along with information regarding the halls where classes will be held with details on professors to take the classes.
- They're capturing videos and images of classroom activities through a small camera built into Glass' frame, and sharing them online. They use Glass to teach lessons from their perspective to share with others, or for their own reference. They're propping the glasses on students, and using the footage and images from young people to understand what they see and how they learn.
- Even more common, educators broadcast from inside the classroom, leading science labs, group discussions or even performing surgery for remote audiences. They show it in real time through Google+ hangouts and as videos shared later through YouTube, personal blogs and other forms of social media.

Improving Classroom Instruction

- Teachers can record and observe their own teaching practices.
- Create mini-documentaries to enhance storytelling in the classroom.
- Capture science in everyday life via photos, videos, audio and images and share with the class.
- Facial recognition to help teachers identify their students.
- Display detailed information on student's academic positioning, allowing teachers to tailor lessons to students' strengths and weaknesses.
- Lecture feedback system that lets a teacher know when students are falling behind. Group tutorial session like Google hangouts with teachers to clarify any points or questions that may have been missed or coordinate with teachers on homework.

Access of Learning Resources

- Learn new languages using Google translator.

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- Create timetables/schedules for teacher, lectures and students.
- Students can use Google Now for personalized search tailored to their personal learning needs.
- Access to teachers/specialists (or students) at a distanc
- Remote teaching and one-to-one tutor sessions.
- Teachers can create real time connections with home-schooled and remote students taking education beyond the classroom.
- Interact with instructors and peers in a classroom setting via online learning.
- YouTube education for distance learning.
- Teachers can document a lessons to share with other teachers.
- Document and keep sharable records of lessons that require demonstrations and hands-on experience functionality.
- Record lessons from the teacher perspective and edit together with views from the
- student perspective as a tool for revision and reflection.
- Connect with other educators from different parts of the world via Google Hangout.
- Create a "Teacher View" online to watch a colleague's lesson and offer suggestions in real time that appear in the teacher's eye-line.

Teacher observation

- Teacher evaluations become less intimidating by removing the observer from the physical classroom.
- Teacher observers can easily incorporate short segments of video evidence in their feedback.

Accessibility

- Provide accessibility for students and teachers with visual, auditory and physical handicaps.
- Have a specialist or behavioral expert observe children for signs of a learning disability as they work in their classroom with their teacher.
- Students and teacher who wear glasses can now enjoy easier and more accurate eye examinations in real time.
- Students who are reluctant to ask aloud in lectures can send questions via text SMS to Google Glass.

Communicate with Students' Parents:

- Send messages that contain important information to students' parents such as test scores and report cards.
- Send short video and text message to parents

Google Glass in Education: The other side:

- While all this could be a boon in the education system, there are some cons of having Google Glasses at Schools / Colleges.
- You must keep in mind that electronic devices are still prohibited for students in most schools; though, this is changing very fast. Students could misuse the Glass in a lecture in ways unimaginable. The distractions a smart phone causes in a classroom are well known, students wearing Google Glass will bring about a whole new level of the same.
- This could also happen to Google Glass, being banned at all major concerns / colleges / universities.
- Not to mention a certain invasion of privacy.
- Like with any electronic device, prolonged usage of Google Glass can cause health issues mainly damaging eyesight.
- Lastly, too much use of social media and on the go availability may harm your personal life.

Future scope

With the invention of Google Glass, we have got a futuristic a gadget. Presently it is in limited scope, but Google believes its future is bright and the device itself is "incredibly compelling".Google is trying their best efforts to pass the Project Glass through the FCC this year. As per reports, Google is trying to get FCC's approval this year but there are already several hundred glasses made internally for testing.

Conclusion

Google glasses are wearable computers which use the familiar technologies that bring the sophistication and ease of communication and information access even for the physically challenged class of people who cannot use laptops and mobiles. The adoption and use of Google Glass in education have a

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positive impact on teaching, learning, and research. Google Glass can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers.

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