# Wearable technology a new paradigm in Educational Universities

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## Abstract

Wearable technology, making a mark as the emerging technology where the goal of computing is to minimize the time and accessing the technology everywhere. It helps students in many ways. For identifying buildings by combining Google mobile app and on the campus map. For displaying supplemental material, during lectures. In labs it is used in demonstrations, teaching students doctor surgery techniques.There are different wearable devices available in the market, whichis utilized in the real world.

**Keyword:** Google Glass, Smart Watch, Wearable computing

## I. INTRODUCTION

Wearable technology is a kind of technology that is worn by a user which is used in obtaining specific information. In King Abdul Aziz University all the information about students is available online can be accessed by the smart phones. The information is updated every time instantly on the black board application the student attendance ,student course material, marks, course registration status for the next semester add and drop courses are updated in odus plus .Student current schedule, transcript are uploaded in the website to make easy access to the system .All the information available in the internet can be accessed by the Wearable Technology .There are different devices helps the students to have the better access to the information on the internet, the wearable devices can be easily accessed by the internet through  the Wi-Fi network student an easily access information using smart watch which is a wearable Technology device that can connect without wire  to mobile device which is a smart phone collects notifications of phone calls ,texts, messages social network data  etc.

## II.Literature Review

Wearable technology provides a different way of using information sharing the videos and audios of the course material for students [1].Students from remote areas can listen to the lectures without attending the classes in the university using Google glass. The instructor should wear Google glass and interact with the student by uploading the course content and recording of lecture should be kept on internet .The student can directly access all the information .E-Learning  is the way of studying by which student from different locations can complete the course by listening to the classes which is recorded. In king Abdul Aziz university [2] they started a new website which is called Black Board  System by which the professors who are located in Germany teach the master courses in real time and interact with the students upload information, course content, power point slides and finally conduct the exams and students can able to complete the courses by the end of the semester.It is used in hospitals where the civil surgeon who wants his students to watch the operations or surgeries in real time live broadcasting so that they get a practical approach

## III. Google Glass

This is the most important tool utilized in education. Google Glass is an optical device,touch pad attached on the right side of the glasses[3]. The user can use voice commands and by swiping the screen. These Google Glasses can connect to Cloud Server and access the information very quickly. The information is available online for accessing the related information which reduces the time and energy of the user.Bluetoothdevice also installed to connect with other device to transfer information and receive the data.The student can receive messages, text alerts.

IIIa. Components

The main components required in designing process are Processor, Optical display,Sensors, Camerawhich records the audio and videos that is observed by the user wearing map help the glass. Flash memory OF 16 GB, 12 GB of usable memory, speaker, DC power supply, touch padscreen, a microphone connected to Google

Glass which takes voice commands from the user, Bluetooth device, It uses 4 Generation Wi-Fi connectivity device[4]. The operating system used by the device is android system.It consists of motion sensors and uses global positioning system.
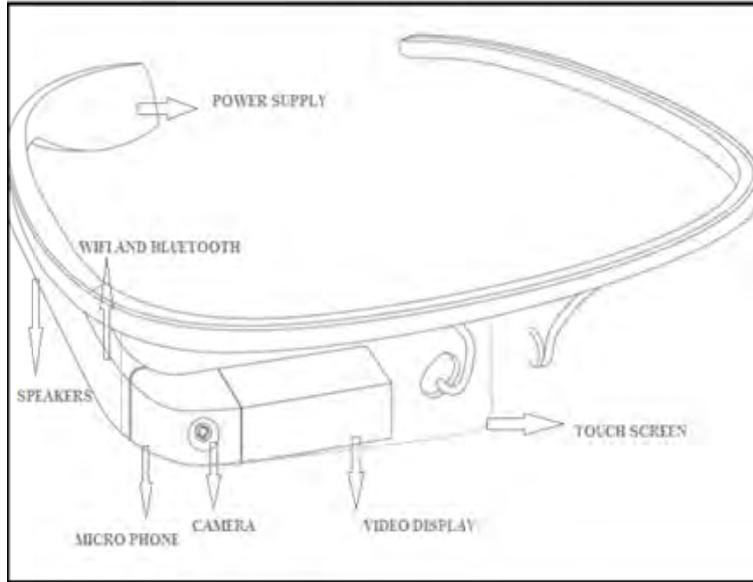


Fig 1. Google glass Hardware Architecture design.

III b. Operating System

There are so many android apps available and separately developed for Google glass it is also known GDK kit that is directly downloaded and installed.Oncethe software is updated the API works using cloud this is a glass aware directly runs on glass. It accesses the audio, video using the Android API. Google maps which are connected to the serverwhich gives complete information about the locations. This is really important for a person who visit the university for a first time may not be aware of the buildings so the university map should be updated and provide online so that they can get a clear idea of the buildings.

## IV Smart Watch

The smart watch can be utilized in various fields we can get information about climate, Web browsing, and messenger. We can make phone calls, receive calls, read the text messages and send the messages, email. Smart watch is a wearable device which is used to connect to smart phone which is located at home or some nearbylocations. We can access the information available in smart phone with the help of smart watch. Utilizing the smart phone the smart phone has several applications .It has access to android applications can be used in efficient way. It can be connected to Wi-Fi Internet and can use the h mobile applications and access to the Google. It can record the voice. The first Smart phone is designed by the IBM which includes the finger print Sensors and uses Linux operating system[5].

The common hardware specifications of smart watch include  a processor which is used to perform all the functions which given as an input to the user .Real time Clock which updates the time .Push buttons are used as an input signal to the watch which decoded by the processor and executed based on the instruction. Flash Memory is used to store the data which is recorded .Micro phone is used to record the voice of the user. Camera is used to take pictures and video recording. Different sensors are used based on the usage finger print sensor which provides security to the device. Power Supply which gives the dc power and can be recharged it is the main component required to use the technology. Display used is touch pad screen which is giving access to android applications. There are different companies which developed smart watches and the market is growing every year,

## V Technology Survey

This survey is made based on student experiences   pursuing undergraduate computer science courses. In this students experience using the technology based on the analyses the findings were developed .An online student survey is made about the utilizing of different resources available online in the internet. In this survey the response ratio in terms of percentage is calculated .The number of students involved in the survey is about 50 students these are few list of resources that is been used by the student to complete their courses.

Table 1.Technology v/s Percentage of Response

| Technology | Response ratio |
|---|---|
| lecture recording | 30 |
| E books | 40 |
| Wikipedia | 25 |
| Simulation software | 50 |
| Course content | 60 |
| Google | 20 |
| you tube | 30 |
| instant messaging | 25 |

and they take help of the internet resources which makes them easier to understand and comfortable way of learning. The response ratio of the students is more in the case of the accessing information of the course content. This course content consisting of the course material that is uploaded by the course instructor .

In this survey most students are interested to use wearable technology devices but all this information can be obtained in a single device that makes more comfortable than using different devices to access different websites .Suppose the software needs to be loaded. The messages will be sent in mobile so it makes user difficult in using the devices. The different manufacturing companies who developed the electronic gadgets should consider the request from the user and try to build a wearable device which makes comfortable in learning an used mainly by the university students and in medical applications and hope for a better future for all the graduates and the post graduates students
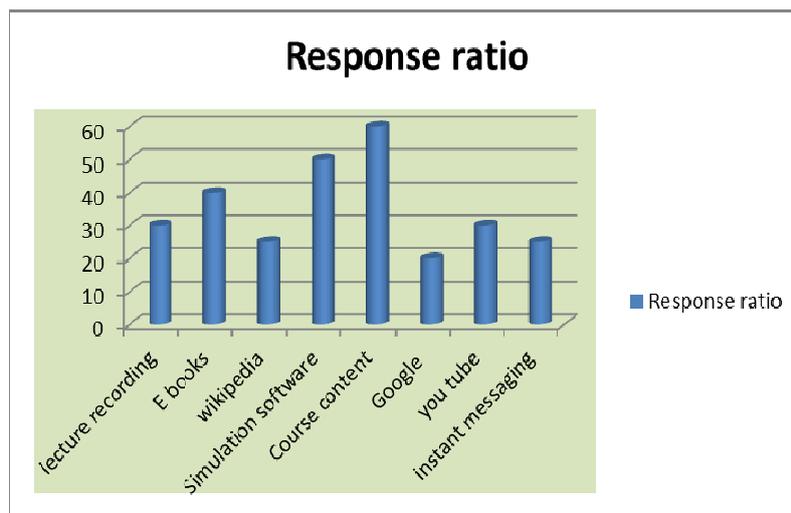


1.Chart shows the percentage of response ratio of the number of students.

More percentage of students will access more information for the course content, simulation software. The faculty should develop an appropriate course material including slides, solution to mathematical problems which makes the student learning easier.

Instead of carrying laptops, tablets, iPods and recording devices can be replaced  in class instead they can use only one wearable technology to access to all of the information. In labs simulation software is more important to develop the new applications. The students should be aware of new technology that is been used and should update the software that makes them easier to understand than the older version. Even faculty should update the new software and the course content once in 6 months to understand the new concepts.

Table2.Technology vs percentage of usage

| Technology | percentage of usage |
|---|---|
| smart phones | 65 |
| Laptops | 75 |
| Tablets | 55 |
| Smart watches | 45 |
| Google Glass | 50 |
| Virtual Reality Gear | 30 |
| Wrist bands | 35 |
| Go Pro | 20 |
| Ipods | 25 |

This results is been obtained by taking the inputs from the students .These are the various types of wearable technology devices used by the students. This survey is useful to understand the efficient use of the wearable devices
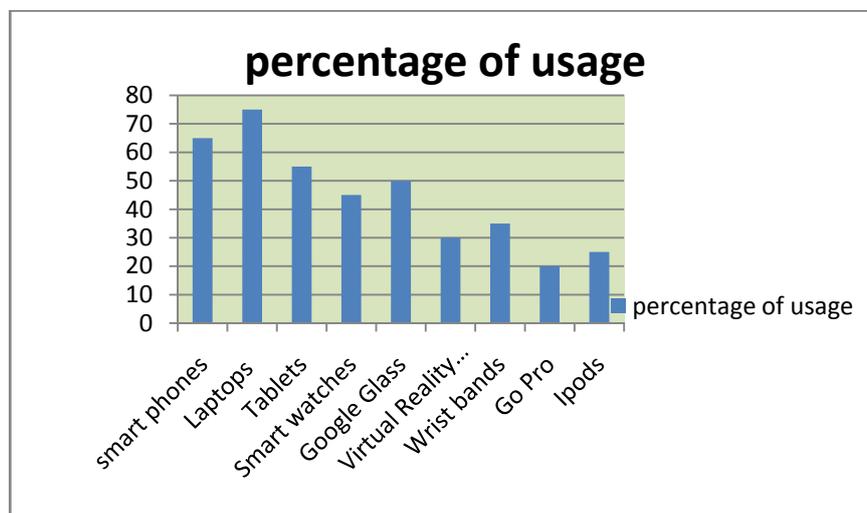


Technology Vs students Percentage

## CONCLUSION

In this paper different wearable technologies and their design methodologies are explained. The efficient utilization of wearable technology is being identified in the education. In what way  the wearable devicessave time   and makes the students more comfortable in learning is briefly explained with the help of survey. This survey is been made to analyze the use of technology in various fields like  medical applications ,Technological universities . The students should be  aware of the current technology to better understand the course material and use the information available in the form of the videos and text .Augmented Reality is the new concept of understand subjects where the computer generate the video and graphics to the real content which is converted to an video. This makes students understand the concept that is going on in the real world. The various companies had developed different products recently Apple company [15] had launched apple smart watch which is able to connect with smart phone and ipad at the same time.It gives information about the maps to identify the exact time and destination location .It monitors the health of the user and send sends relevant information required .In future most of the wearable technologies is used almost in all the areas and it is extremely help the user and saves the time of the user.

## REFERENCES

[1]    www.theguardian.com/guardian-master classes/introduction-to-google-glass-michael-rosenblum-digital-course
[2]    www.kau.edu.sa/AccessPage.aspx?Site_ID=0&lng=AR&SYS_ID=351
[3]    http://www.huffingtonpost.com/vala-afshar/14-google-glass-innovativ_b_5410893.html
[4]    http://www.wearabledevices.com/2013/12/10/wearable-medical-devices-market-is-expected-to-reach-usd-5-8-billion/
[5]    http://www.zdnet.com/pictures/before-the-iwatch-a-history-of-smartwatches-in-pictures/

[6] Altwaijry, H.; Moghimi, M.; Belongie, S., "Recognizing locations with Google Glass: A case study," Applications of Computer Vision (WACV), 2014 IEEE Winter Conference on , vol., no., pp.167,174, 24-26 March 2014.

[7] http://gadgets.ndtv.com/wearables/news/sony-launches-smartband-talk-and-smartwatch-3-wearables-at-ifa-586390

[8] http://www.edudemic.com/wearable-tech-in-the-classroom.

[9] http://www.emergingedtech.com/2013/04/5-ways-google-glass-can-be-used-in-education/

[10] http://www.slideshare.net/godhanisarkar/google-glass-glasses-presentation-ppt

[11] http://www.teachthought.com/technology/36-ways-to-use-wearable-technology-in-the-classroom.

[12] Kukulska-Hulme, Agnes, and John Traxler. "Mobile teaching and learning." Mobile learning-a handbook for educators and trainers (2005): 25-44.

[13] http://www.teachthought.com/apps-2/52-of-the-best-apps-for-classrooms/

[14] http://en.wikipedia.org/wiki/Augmented_reality

[15] https://www.questia.com/magazine/1G1-383633161/techknow4

[16] Kanis, Marije, et al. "Toward wearable social networking with iBand." CHI'05 extended abstracts on Human factors in computing systems. ACM, 2005.

[17] Kanis, M., Winters, N., Agamanolis, S., Gavin, A., &Cullinan, C. (2005, April). Toward wearable social networking with iBand. In CHI'05 extended abstracts on Human factors in computing systems (pp. 1521-1524). ACM