A Survey of Gadgets for E-Learning 2014

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Abstract - As of 2014, there were approximate 7.2 billion gadgets worldwide used. These numbers were higher than the total world population which was about 7 billion. Also, IPWatchdog presented the Secret to Commercial Success of Wearable Gadgets that the sales of wearable gadgets were 182 percent higher than in the 2013 holiday season. There were reports that global shipments of wearable gadgets would probably explode from 27 million shipments in 2014 to 116 million shipments in 2017. Thus, it could be said that Gadgets we can wear or "wearable gadgets" were getting more and more popular. And one of the most popular gadgets was Google Glass which has been reviewed so many times and places and that it was in the future of eLearning. However, there were both good points and bad points of google glass have been reviewed which were enabled to apply for adapting to create higher benefit for eLearning in the future. Therefore, this paper would discuss about the Gadgets for eLearning, which consists of: Four Ways Google Glass Can Help, Five Reasons to Pay Attention to Google Glass, Thirty Usages of Google Glass for Education, how Wearable Gadgets Can Improve eLearning Productivity, Top Five Gadgets for eLearning from TheElearningSite and from TaraMagazine, Gadgets for Education, and Gadgets in 2015. This paper concluded that since gadget and eLearning technology are changing very fast, all parties concerned must search Google for up-to-date information to study and apply for the benefits of themselves, their organizations, their countries, and the world.

Keywords - Gadgets, Google Glass, Gadgets for E-Learning, Gadgets for Education

1. INTRODUCTION

As of October 2014, there are about 7.2 billion gadgets in the world [1]. Thus, it can be said that the number of gadgets is higher than the population of the world which is about 7 billions. Gadgets we can wear or "wearable gadgets" are getting more and more popular.

Fig 1. Examples of Wearable Gadgets
On 15 November 2014, IPWatchdog presented the Secret to Commercial Success of Wearable Gadgets [2]. It was said that sales of wearable gadgets will be 182 percent higher than in the 2013 holiday season. There were reports that global shipments of wearable gadgets will probably explode from 27 million shipments in 2014 to 116 million shipments in 2017. One of the most popular gadgets is Google Glass which has been reviewed so many times and places and that it is in the future of eLearning [3].

The first author of this paper also reviewed Google Glass, as shown in Fig 2. [4] where she presented her view of its good points and bad points.

The first good point is that it is ready to be used because the user is wearing it and does not have to try to find his mobile phone. The second good point is that the system is reliable. The third good point is that it is fast and accurate. The fourth good point is that it allows user to use voice command even in noisy place. The fifth good point is that there are a lot of Apps developed by third party developers all the times. The fifth good point is that the user can order picture taking with a wink of his eye and so the person whose picture is being taken does not realize it. The sixth good point is that it is easy to setup and use. The seventh good point is that it can be used while wearing shortsighted lenses.

The first bad point is that the battery does not last as long as a full day. The second bad point is that the user can feel the heat from the battery in extended usage. The third bad point is that the quality of the microphone is not very good. The fourth bad point is that the user may get dizzy after extended usage. The fifth bad point is that it is not really stand alone in the sense that it needs data from the smart phone connected. The sixth bad point is that it is rather expensive.

Fig 2. Google Glass

Fig 3. Charmonman Wearing Google Glass and Patthamasoot Wearing many Gadgets.
This paper will discuss:

- Four Ways Google Glass Can Help
- E-Learners See Better
- Five Reasons to Pay Attention to Google Glass
- Thirty Usages of Google Glass for Education
- Wearable Gadgets Can Improve eLearning Productivity
- Top Five Gadgets for eLearning from TheElearningSite
- Top Five Gadgets for eLearning from TaraMagazine
- Gadgets for Education
- Gadgets for Elderly
- Gadgets in 2015

II. FOUR WAYS GOOGLE GLASS CAN HELP E-LEARNERS SEE BETTER

On 7 July 2014, E-learningstudios.com which is an e-learning studio in Australia posted “4 Ways Google Glass can help e-learning students see better” [8] which may be interpreted that Google Glass puts information "closer than at our finger-tips". When anyone has a question, he or she can use a computer or a mobile phone to search Google but with Google Glass, he can make a gesture or voice command like "OK Glass..." and Google Glass will put the answer for the glass wearer to see text, diagram, video, and etc.

The first way is "to see with Shared Eyes". Looking at the same thing or the same view, a novice and an expert may not see the same thing. Google Glass will allow the user to take pictures and record videos hands free. With Google Glass, a Novice e-learner can use voice command "OK Glass, record a video". The video recorded by Google Glass capture everything in details and not just what the novice see. The video can then be analyzed without the novice having to try to recall what he saw and without having to ask the expert what the expert saw that the novice did not see, i.e. see with the shared eyes of the novice e-learner and the expert.

The second way is "to see with Informed Eyes". With Google Glass, an e-learner can recall any resource he needs. Without Google Glass, an e-learner may comes across a situation he was trained years ago and did not see what he was supposed to be trained at that time. Now he would have to go back to the
manual, the material for the previous e-learning course or training video, or go back to the instructor. With Google Glass, the e-learner can recall any resources recorded by Google Glass.

The third way is "to see with Engaged Eyes". With Google Glass, an e-learner can let the Glass see whatever needed to be seen while the e-learner can remain engaged with the people he is supposed to be working with or the task he is supposed to be working on. Especially, when the e-learner is supposed to be working with heavy machinery, letting Google Glass see for him means he can get better safety. In health-care home, the health-care worker can stay connected with the patients and provide services to the patient without having to use his eyes to read the charts and etc.

The fourth way is "to see with new eyes". Because of the novelty of Google Glass, the e-learner is excited and find the event more memorable. The novelty will not be faded because more and more Apps are created to be used with Google Glass all the time.

Google Glass can create "Augment Reality" causing traditional learning materials to be interactive and engaging. E-learningstudios.com is also developing more and more Apps to use with Google Glass.

### III. FIVE REASONS TO PAY ATTENTION TO GOOGLE GLASS

On 9 October 2013, Upsidelearning.com posted "Five Reasons to Pay Attention to Google Glass" [9]. The post stated that Google Glass offered a lot for e-learning designers.

The first reason is "Ubiquitous -- always on, always there" in the sense that Google Glass is more "on and there" than personal computer which we have to leave on the desk, than laptop and notebook which we carry around but would not use them everywhere, than tablets and smart phones which we carry but do not look at them all the time. Google Glass is what we wear on our eyes -- always on and always there.

The second reason is that Google Glass is capable of "Continuous Capture". With its built-in camera, it can capture photos and video thru the wearer's field of view, i.e. it captures what the wearer is really seeing. Google Glass will lead to video generated from everything the wearers see resulting on very very large volume of all kinds of video.
The third reason is that Google Glass is "Truly location aware". Google Glass always know where it is. It can provide information just-in-time and based on location, either in the workplace or in the field.

The fourth reason is that it has ability to do "Augment Reality" similar to the case of smart phone which has to be equipped with sensors and GPS as opposed to Google Glass which does not have to be equipped with sensors and GPS. Such ability of Google Glass will be very useful for e-learning in the future.

The fifth reason is that Google Glass is truly hands-free whereas computers and smart phones need the users' hands to operate. Google Glass does not need hardware input device. With Google Glass, the user does not have to use his hand to activate input, but can use his voice command. The users' hands can be used on something else.

IV. THIRTY USAGES OF GOOGLE GLASS FOR EDUCATION

![Fig 6. The List of Usages for Education](image)

UAF eLearning in Alaska proposed 30 education innovations using Google Glass [10]. Ten examples as shown in the UAF documents will be presented here.

The first example is to create first-person video guides for collective class experience in real time. The second example is to document and keep sharable records of lesson that require demonstration and hand-on experience functionality. The third example is for remote teaching and one-to-one tutor sessions. The fourth example is for facial recognition to help teacher identify students. The fifth example is to connect with other educators from different places via Google Hangout. The sixth example is to display more details information on students' academic positioning to tailor lessons for them. The seventh example is for real-time researching for cross referencing and documents. The eighth example is to provide accessibility for students and teachers with visual, auditory and physical handicaps. The ninth example is to allow students and teachers who wear glasses to enjoy easier and more accurate eye examinations in real time. The tenth example is to allow interaction among students, teachers, and peers in a classroom setting via online learning.

V. WEARABLE GADGETS CAN IMPROVE ELEARNING PRODUCTIVITY

If wearable gadgets can improve productivity in activities in general, it can improve eLearning activities as well. From a report in Skyprep.com on 2 May 2014 [11], University of London conducted an experiment by letting the participants wore a gadget that keep track of their posture, sleep habits, body temperature and other real-time biometric information. It was found out that the productivity of participants who wore the gadget increased up to 8% in three weeks, and their job satisfaction went up 3.5%. From the above finding, another survey was conducted of 300 IT professionals and found out that 25% said they have plans to introduce wearable gadget to their organizations. As a matter of
fact, companies are creating online courses about how to leverage gadgets to their full capacities. Conceptually, health-related gadgets may be used in the future to improve eLearning productivity.

VI. TOP FIVE GADGETS FOR ELEARNING FROM THE ELEARNINGSITE

From TheElearningSite.com [12], top 5 tech gadgets for eLearning students were introduced.

The first gadget is the mobile phone for students to access course catalogues, online library catalogues, university maps, school directories, and etc.

The second gadget is external hard drive to store and retrieve class notes, assignments, presentations, videoconferencing materials, and etc.

The third gadget is Office Chair to use comfortably during online study time at home about 12-18 hours per week. The office chair must be designed on ergonomics such as built-in lumber support, tilt tension control and a comfortable seat. The chair should not be so comfortable that the student would fall asleep.

The fourth gadget is a headphone for the student to use a significant number of hours per week. The Bose In-Ear headphones have been recommended because of the ultra-comfortable tips that rest in the bowls of the ear instead of the canal of the ear.

The fifth gadget is memory and retention games to play to prepare for memory and retention of what students learn via online courses. A popular game is Simon Trickster Handheld Edition.

VII. TOP FIVE GADGETS FOR ELEARNING FROM TARAMAGAZINE

In addition to TheElearningSite, TaraMagazine also proposed top five gadgets for eLearning [13]. The ElearningSite recommends mobile phones, external drive, office chair, headphone, and memory and retention games. TaraMagazine recommends Smart phones, Flash drives, Speech Recognition Software, Reading Pens, and Tablets. The first two items from the two places are the same but the last three are not.

For TaraMagazine, the first gadget is Smart Phones to connect students to e-textbooks, online groups, videos, and etc. The second gadget is Flash Drives for storage and retrieval. The third gadget recommended by TaraMagazine is not really a gadget but is Speech Recognition Software such as LiveScribe and DragonSpeak to transform teachers' lecture into printed materials so that students can focus on the lesson rather than focusing on taking notes. The fourth gadget is a reading pen to pass it over the written word to hear what it is and find the definition. The fifth gadget is a tablet which except for using as a phone it functions similar to the mobile phone in the sense of reading text and watching video without eye strain. Similar to the smart phone, the tablet has a camera to connect for video conference.

VIII. GADGETS FOR EDUCATION

There are many gadgets available to support education in the present days. From “EmergingEdTech.com” [14], there are many examples of gadgets that support teachers in teaching. This section will provide 5 examples of gadgets for education.
The first example is “Portable Projectors” which is a small projector to display charts, websites, videos, and lectures while teaching. The good point of this gadget is that it’s lightweight where the teachers are able to carry it from classroom to classroom.

![Fig 8. Portable Projector](image)

The second example is “Digital Pens” which can be used for note-taking. Digital pens cause the notes become editable. Even the notes are written in papers, digital pens would record them and send to digital devices.

![Fig 9. Digital Pen](image)

The third example is “Tablets”. Tablets become more and more popular for education because students and teachers are able to use to search for information. Also, there are many applications provided in the tablets that could support education as well.

![Fig 10. Tablets](image)

The fourth example is “Digital Microscopes”. It contains a built-in camera where it can capture images and immediately display on screens in 4D. The students are able to save images from the microscope for later study.

![Fig 11. Digital Microscope](image)

The fifth example is “Fitness Bands”. It has functional role in Physical Education and Biology classes. The gadget will monitor each student’s activity level in gym class to motivate students to exercise more for their health.
IX. GADGETS FOR ELDERLY

From “Telecom Journal” [15], the second author reviewed useful gadgets for elderly people. The 5 examples of gadgets for elderly will be discussed in this section.

The first example is “Jitterbug” which is a mobile phone that has features and characteristics that support elderly people. Jitterbug has big buttons, loud speakers, bright screens, and special buttons for the elderly to call police or family.

The second example is “Vacuum Robot”. As the elderly is too old to clean the house by themselves, therefore, this vacuum robot will help them clean the house automatically.

The third example is “Water Temperature Reducer”. This gadget should place near the shower to reduce the water temperature if the water in the shower seems to be too hot for elderly.

The fourth example is “Safe-T-Element Cooking System”. This gadget will place over the cooking oven while cooking. As the temperature from the oven is higher than the temperature set from the user, the gadget will turn off the oven immediately.
The fifth example is “Doorbell-phone Flashing-light signaler”. This gadget is for hearing-impaired elderly. So, the gadget will flash the light instead of making sound when there is a telephone call or doorbell ringing.

**X. GADGETS IN 2015**

From “phonearena” website [16] posted on 9 November 2014, the article named “15 most anticipated gadgets of 2015”. The examples of the gadgets in 2015 will be presented here.

The first example is “Apple Watch”. The expected release date is Spring 2015. For this version of Apple Watch, Tim Cook aimed to make it look more luxurious than before. Also, to make it more fashionable and fitness oriented piece of technology. It’s provided in different colors, including gold.

The second example is “Samsung Galaxy Note 5”. The expected release date is early September 2015. The appearance of Samsung Galaxy Note 5 is having a larger display with Ultra HD resolution.

The third example is “Samsung Galaxy S6”. The expected release date is early March 2015. It is expected to adopt the design and premium metal frame of devices. The storage should be at least 32GB for the base model.

The fourth example is “HTC One (M9)”. The expected release date is early March 2015. People are hoping that HTC could improve the camera resolution from the HTC One (M8) which was only 4-megapixel resolution.

The fifth example is “Sony Xperia Z4”. The expected release date is late February 2015. The rumor from Sony saying that the new product will be larger than before, which is 5.5-inch display and a Quad HD resolution following the current trend.

The sixth example is “Microsoft Surface Pro 4”. The expected release date is May 2015. Surface Pro 4 will contain more efficient Intel Broadwell 20nm chip. The battery will last longer and the performance is also improved.

The seventh example is “Amazon Kindle Fire 2015 edition”. The expected release date is late September 2015. The screen sizes might be larger to support more laptop-like productivity.
XI. CONCLUDING REMARKS

As of October 2014, the number of gadgets is slightly higher than the number of world population, i.e. about 7.2 gadgets and 7 billion people. One of the most talked-about gadget is “Google Glass”. The other popular topic is eLearning and more and more gadgets, including Google Glass, are used for eLearning.

This paper discusses Four Ways Google Glass Can Help E-Learners See Better, Five Reasons to Pay Attention to Google Glass, Gadgets for Education, and Gadgets for Elderly. Thirty Usages of Google Glass for Education, Wearable Gadgets Can Improve eLearning Productivity, Top Five Gadgets for eLearning from TheElearningSite, and Top Five Gadgets for eLearning from TaraMagazine. Since gadget and eLearning technology are changing very fast, all parties concerned must search Google for up-to-date information to study and apply for the benefits of themselves, their organizations, their countries, and the world.

REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)


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