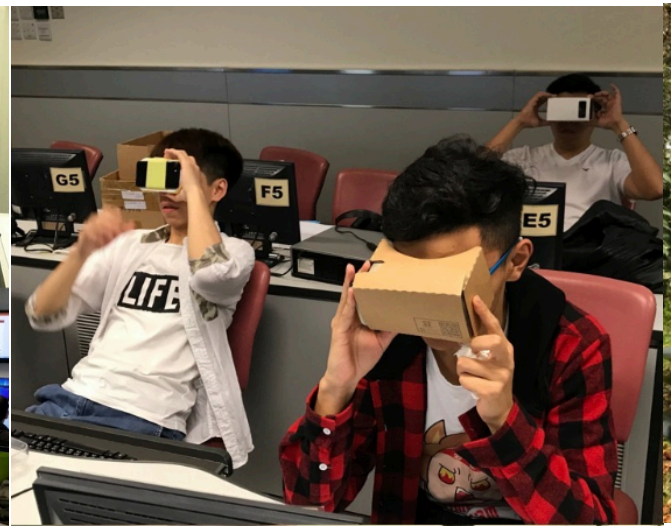
資訊科技教育教學法系列：
在小學有策略地運用虛擬實境（VR) 設計教學活動提升學與教效能
EI0020190340
第一節



香港中文大學 學習科學與科技中心 (CLST)

Centre for Learning Sciences and Technologies (CLST)
The Chinese University of Hong Kong

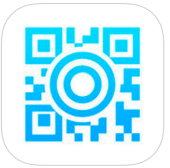
資訊科技教育教學法系列：
在小學有策略地運用虛擬實境（VR) 設計教學活動提升學與教效能
EI0020190340

SECTION 1

- 步驟一： 將你手機連接 WIFI NETWORK

- 步驟二：下載 YOUTUBE APP

- 步驟三：下載 QRCODE READER APP
  例如： QR Code Reader from Kaywa



步驟四：下載以下 VR/ AR APPs

Google Streetview

Discovery VR

Within - VR (Virtual Reality)

Google Cardboard

Google Expeditions

HP Reveal

小學 AA班

第一節：
日期： 2019/10/28 (星期一)
時間： 18:30 - 21:30
地點：香港中文大學崇基校園信和樓614室

第二節：
日期： 2019/11/04 (星期一)
時間： 18:30 - 21:30
地點：香港中文大學崇基校園信和樓614室

導師簡介

姓名： 馮家俊

Fung Ka Chun Chris (chrisfung.cuhk@gmail.com)

B.Ed. (HON) / PDES (ENG)/ M.A. CUHK

AiTLE 資訊科技教育領袖協會

Associate Executive Committee Members 執行委員會從屬委員

專研： 網絡探究 WebQuest

資訊素養 Information Literacy

教育遊戲 Game-based Learning

移動學習 Mobile Learning

自主學習 Self-directed Learning

課程目標：

本課程旨在介紹如何運用虛擬實境技術 (VR) ，以提升在課堂及户外學習活動的學與教效能。

活動詳情：

1. 虛擬實境技術在教育中的理論、定義和最新趨勢
2. 使用虛擬實境技術設備的的技巧和基本技能
3. 設計和實施虛擬實境於教學中
4. 虛擬實境的課堂設計與推行
5. 深入研究虛擬實境課堂的案例及了解虛擬實境如何提升學與教效能
6. 拍攝 360 相片及影片
7. 在不同的虛擬實境平台上傳輸、後期處理、編輯和發布360影片
8. 設計虛擬實境學與教材料
9. 其他常用的虛擬實境平台

Objectives:

This course aims at：

to introduce how teachers may enhance learning and teaching effectiveness by adopting virtual reality (VR) technology and relevant strategies in the classroom as well as outdoor learning activities.

Session 1

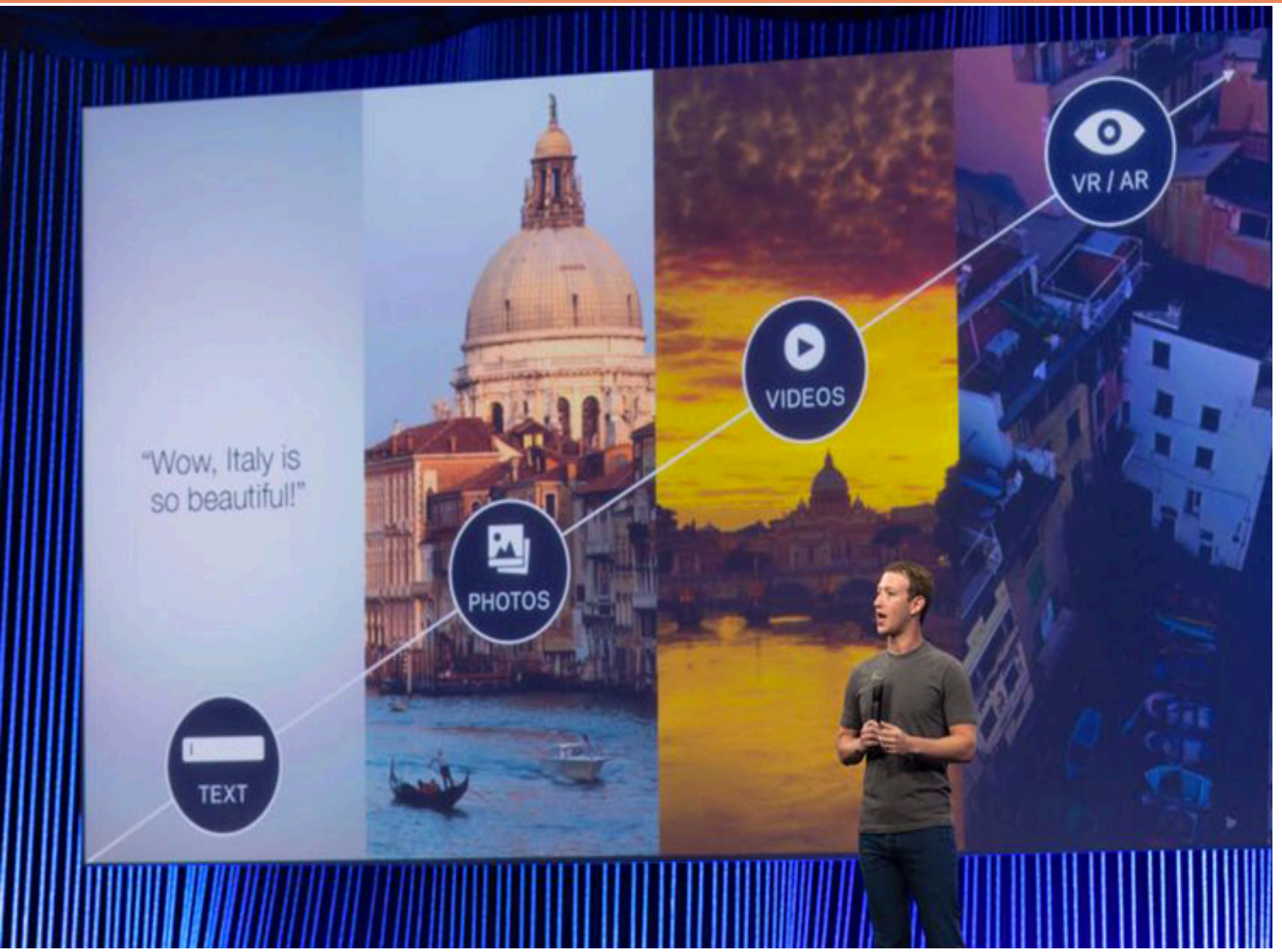
1. Theory, definition and global trend of VR Technology in Education
2. Techniques and Essential Skills of Using VR Equipment
3. VR Design and Implementation for Learning and Teaching
4. VR Lesson Design and Implementation
5. In Depth VR Lesson Case Studies and How They Enhance L&T Effectiveness
6. Discussion of Assignment

Session 2

1. Discussion of Assignment
2. 360 Photo and Movie Capture in the Chung Chi Campus
3. 360 Movie Clip Transfer, Post-processing, Editing and Publishing on Different VR Platforms
4. Composing VR Learning and Teaching in EduVenture-VR
5. School Management in EduVenture-VR
6. Other Popular VR Platforms
7. VR Cross Platform Scene Construction Techniques
8. Conclusion and Discussion

1. Theory, definition and global trend of VR Technology in Education

Virtual Reality(VR) vs. Augmented Reality (AR) vs. Mixed Reality (MR)



When people grow tired of posting photos and videos on social media, what then?

Virtual-Reality

posts, according to Mark Zuckerberg. – Facebook

Virtual Reality(VR)

- computer technologies that use software to generate the realistic images, sounds and other sensations that replicate a real environment (or create an imaginary setting), and simulate a user's physical presence in this environment.

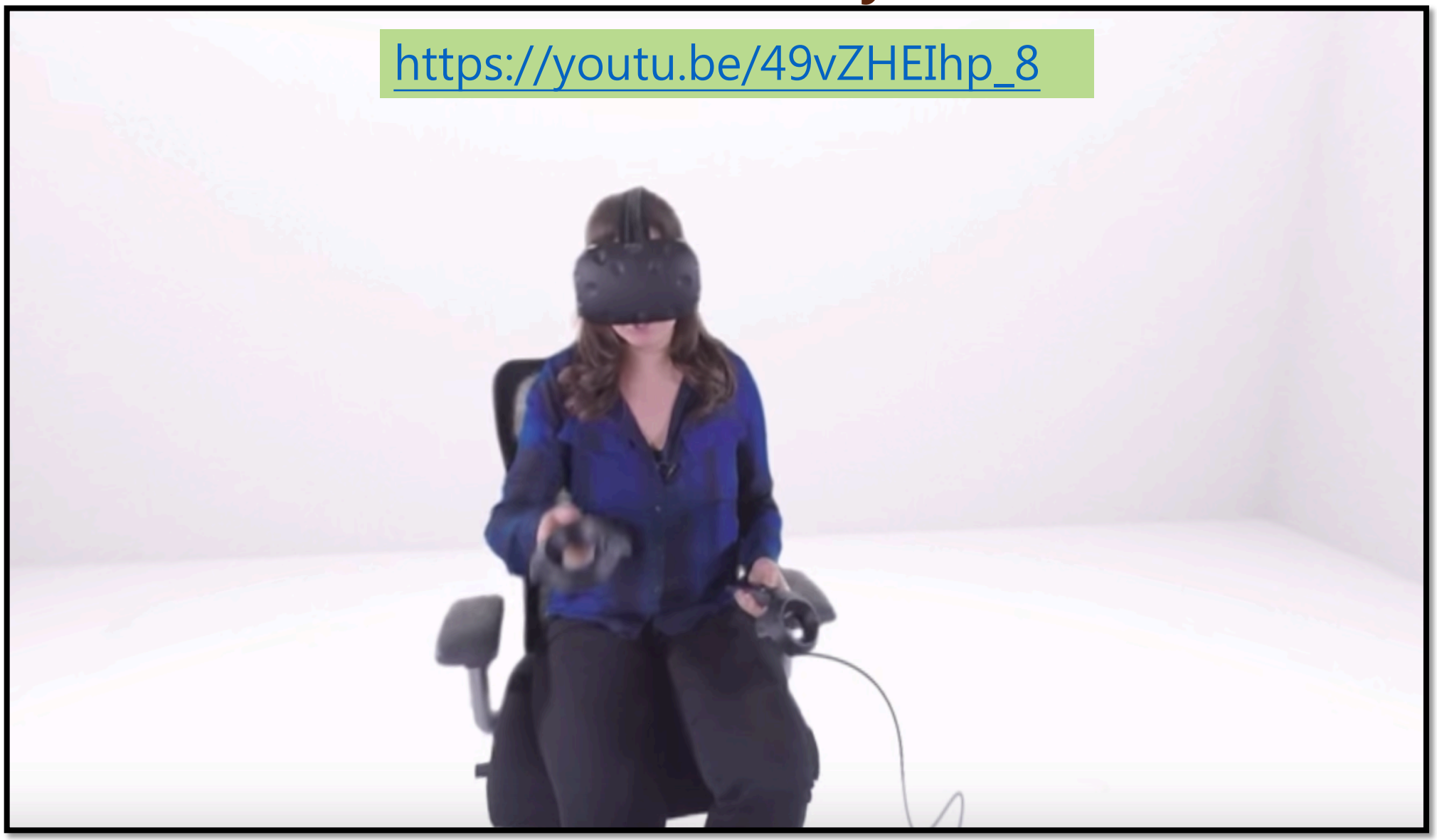
- VR has been defined as "...a realistic and immersive simulation of a three-dimensional environment, created using interactive software and hardware, and experienced or controlled by movement of the body" or

- as an "immersive, interactive experience generated by a computer

Capture 拍攝 → Cloud 儲存 → View 觀看

Virtual Reality VR

https://youtu.be/49vZHEIhp_8



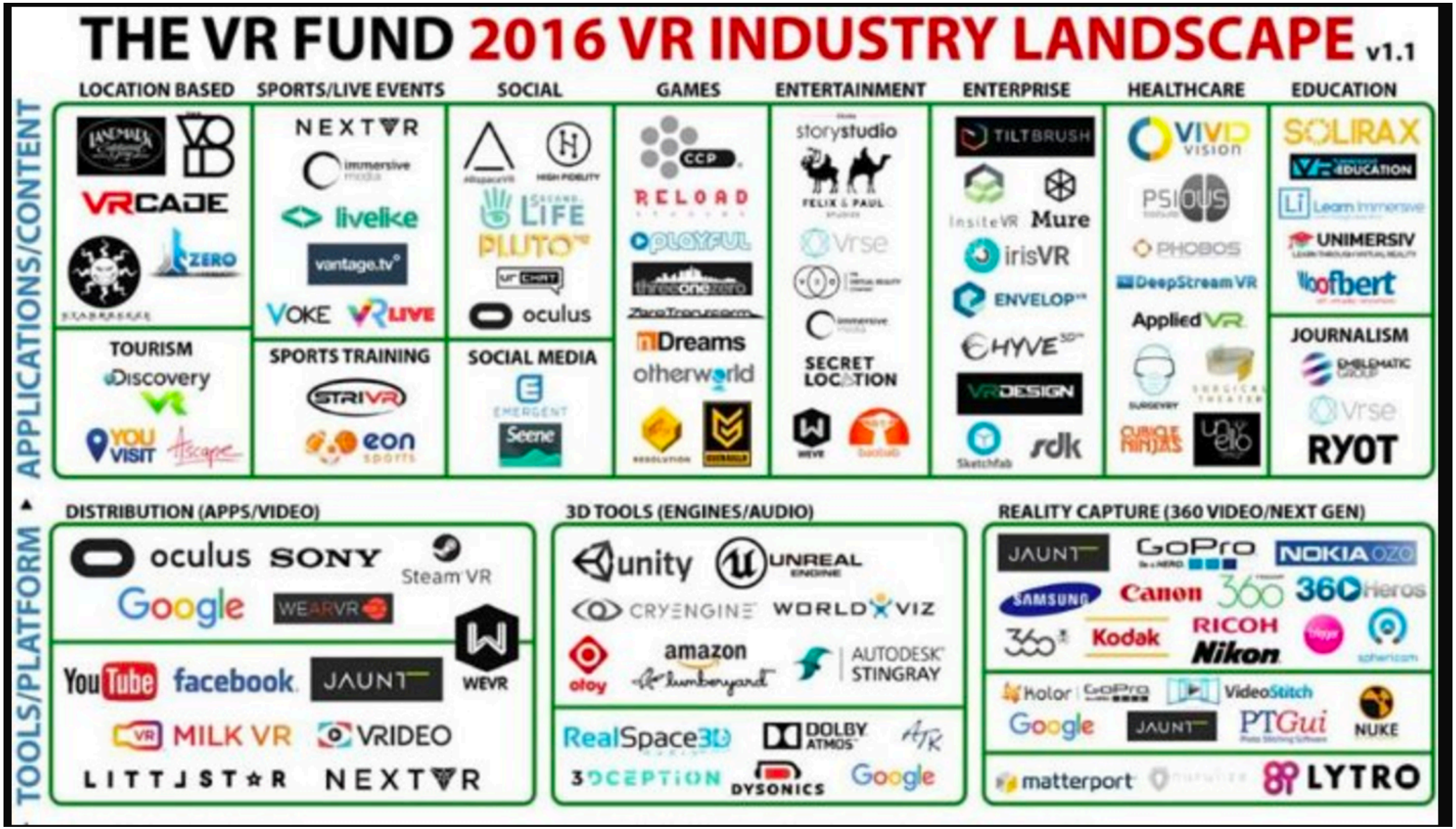
Properties of Virtual Reality VR

- VR is immersive
- VR is about transporting users
- VR is usually a single user experience

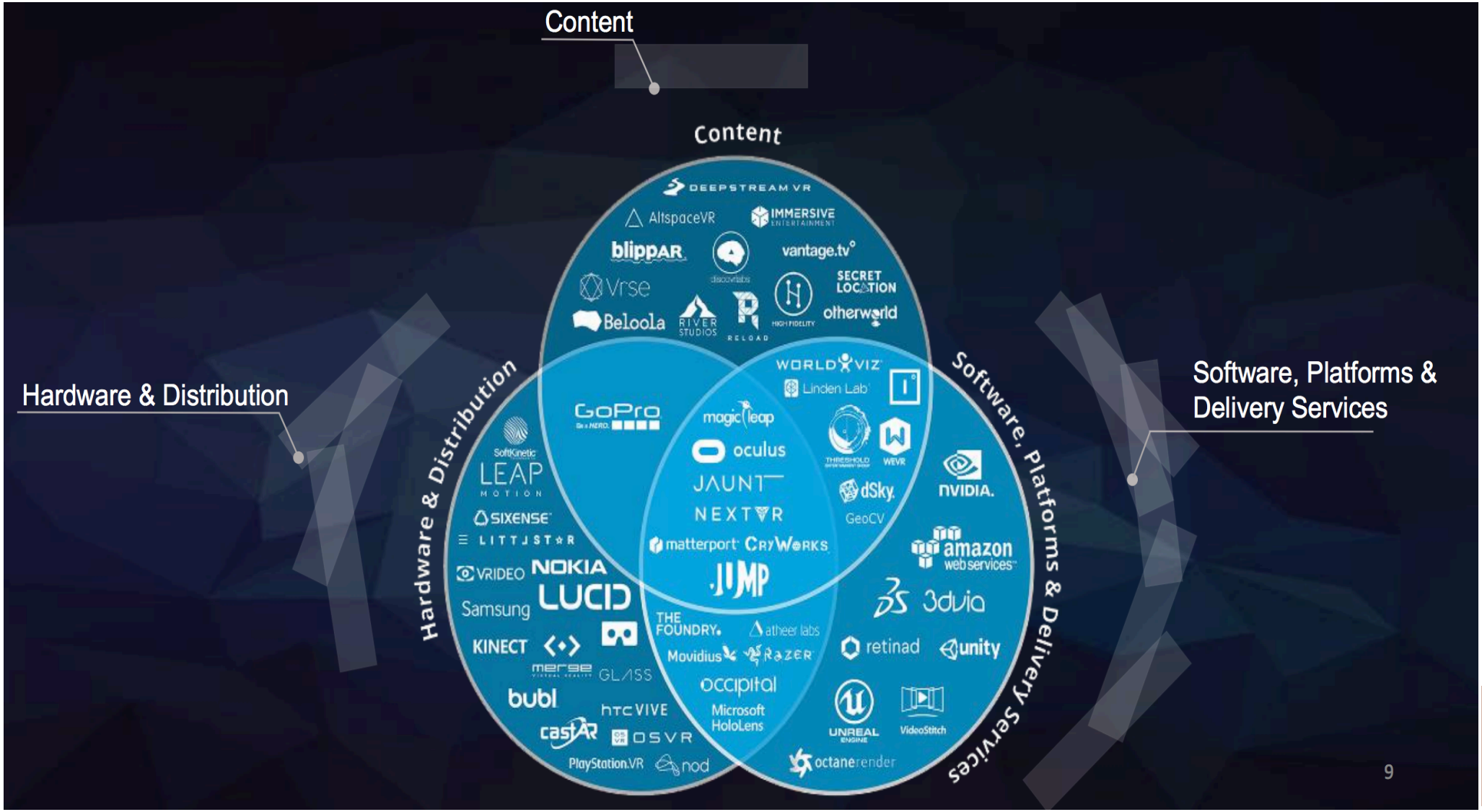
Applications for Virtual Reality VR

- Gaming
- Video
- Education
- Theme parks
- Other (non-entertainment)

Virtual Reality VR ECOSYSTEM



Virtual Reality VR ECOSYSTEM



Virtual Reality VR : Input Devices

GoPro Ball	Kodak PixPro SP360 4k x2	Gear 360	Ricoh Theta 360

Virtual Reality VR ：Output Devices

Virtual Reality VR ：Controller

VIVE

oculus

Razer Hydri

Stem

Magic wand

Leap motion

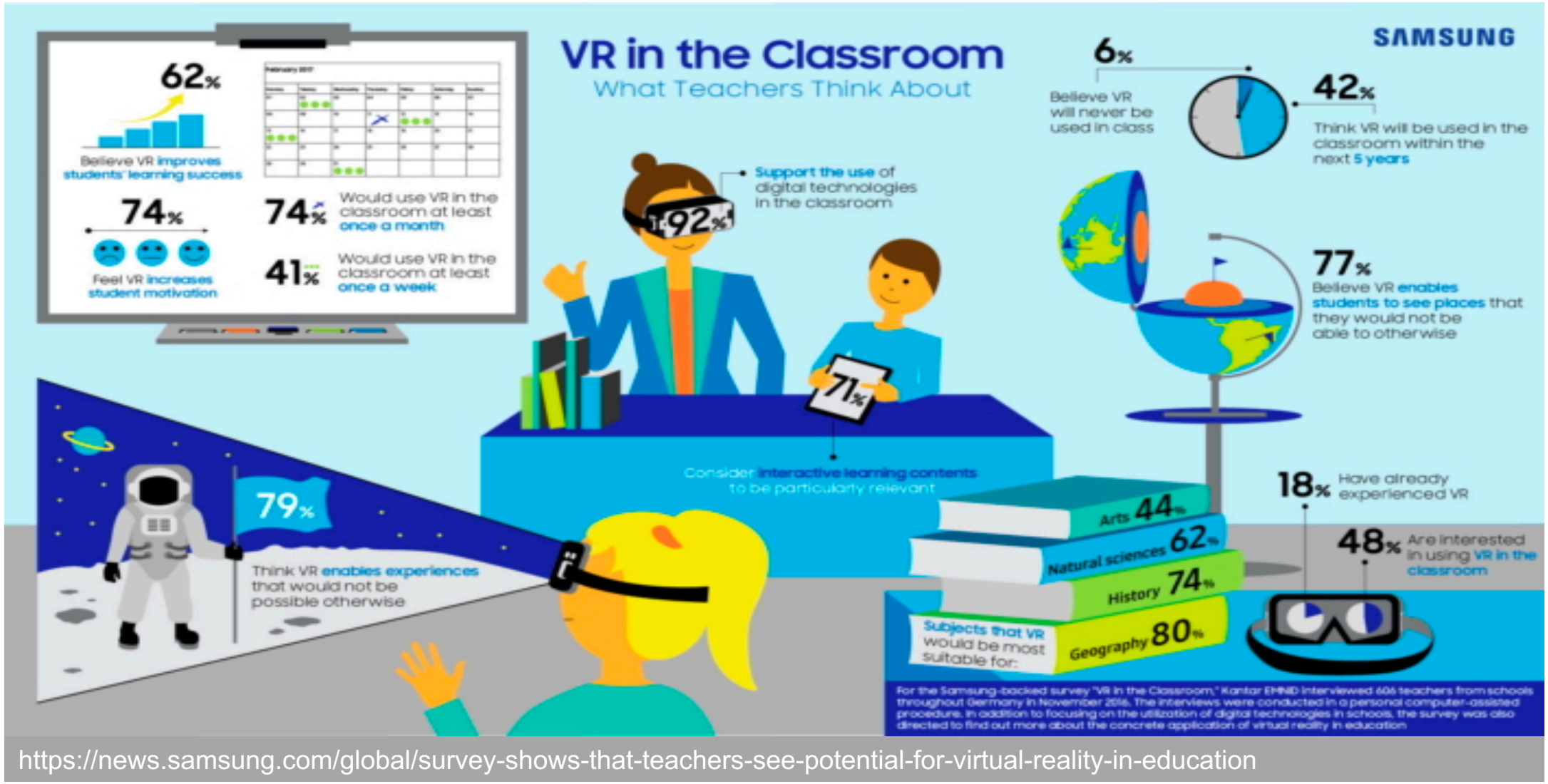
Control VR

PrioVR

為甚麼要應用VR 技術於學與教

- 能讓學生與遠方及難以到達的環境中的事物進行互動，從而使學習充滿樂趣。
- 學生在課堂上透過 VR 旅程，隨時可前往世界各地，尤如身歷其境，
  例如透過豐富資源及方便搜索的互聯網，參觀博物館、歷史遺跡、畫廊及展覽館。
- 可透過虛擬探險前往北極，認識那裡的野生動物及瞭解當地物種。
- 學生亦可虛擬探索人體的不同部位，增進人類生物學知識。

為甚麼要應用 VR 技術於學與教



https://news.samsung.com/global/survey-shows-that-teachers-see-potential-for-virtual-reality-in-education

SURVEY:
Virtual Reality is Rapidly Coming to the Classroom

How familiar are you with the concept of virtual reality (VR)?

- **32%** Only slightly aware
- **53%** Aware and beginning to investigate
- **10%** Planning to use VR over the next year or two
- **5%** Already using

Have you ever tested VR or tried it in your school?

- **23%** YES
- **77%** NO

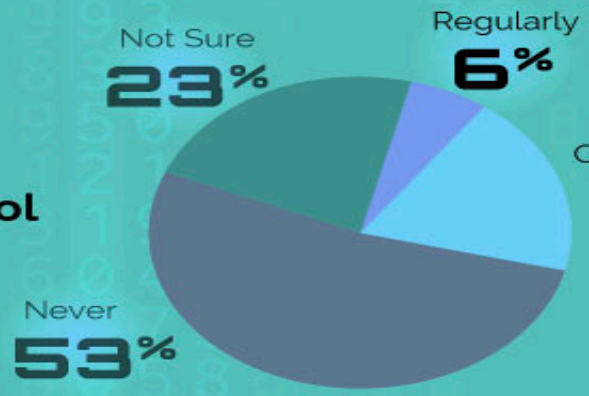
If you have tried VR in school, in what subject areas?

- Science **52%**
- History **29%**
- Other (computer science, social studies, language arts, technology) **23%**
- Engineering **20%**
- Arts **15%**
- Math (2+2=) **12%**
- Design **10%**
- English (Aa) **9%**

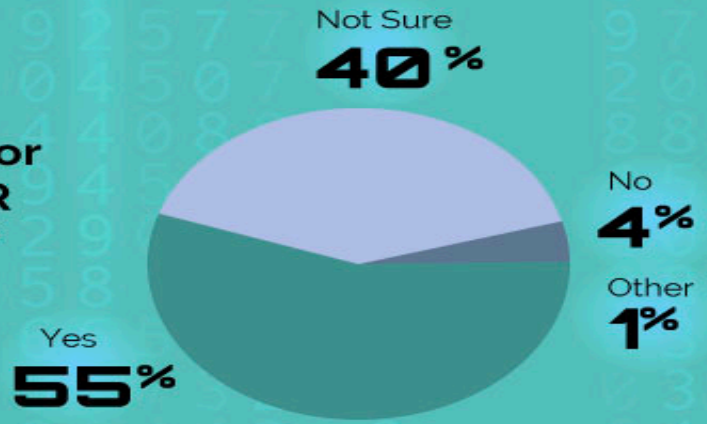
Which brands of VR have you used?

- Google **74%**
- Other **18%**
- oculus **17%**
- SAMSUNG **14%**
- Microsoft HoloLens **4%**

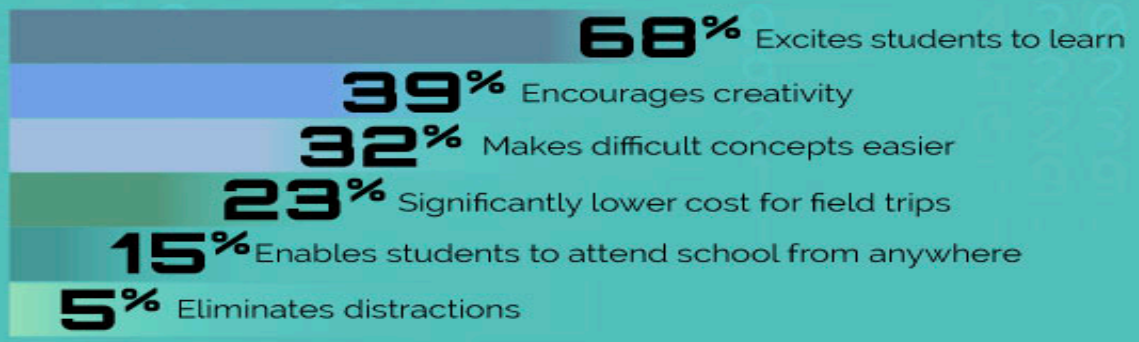
How often does your school use VR?

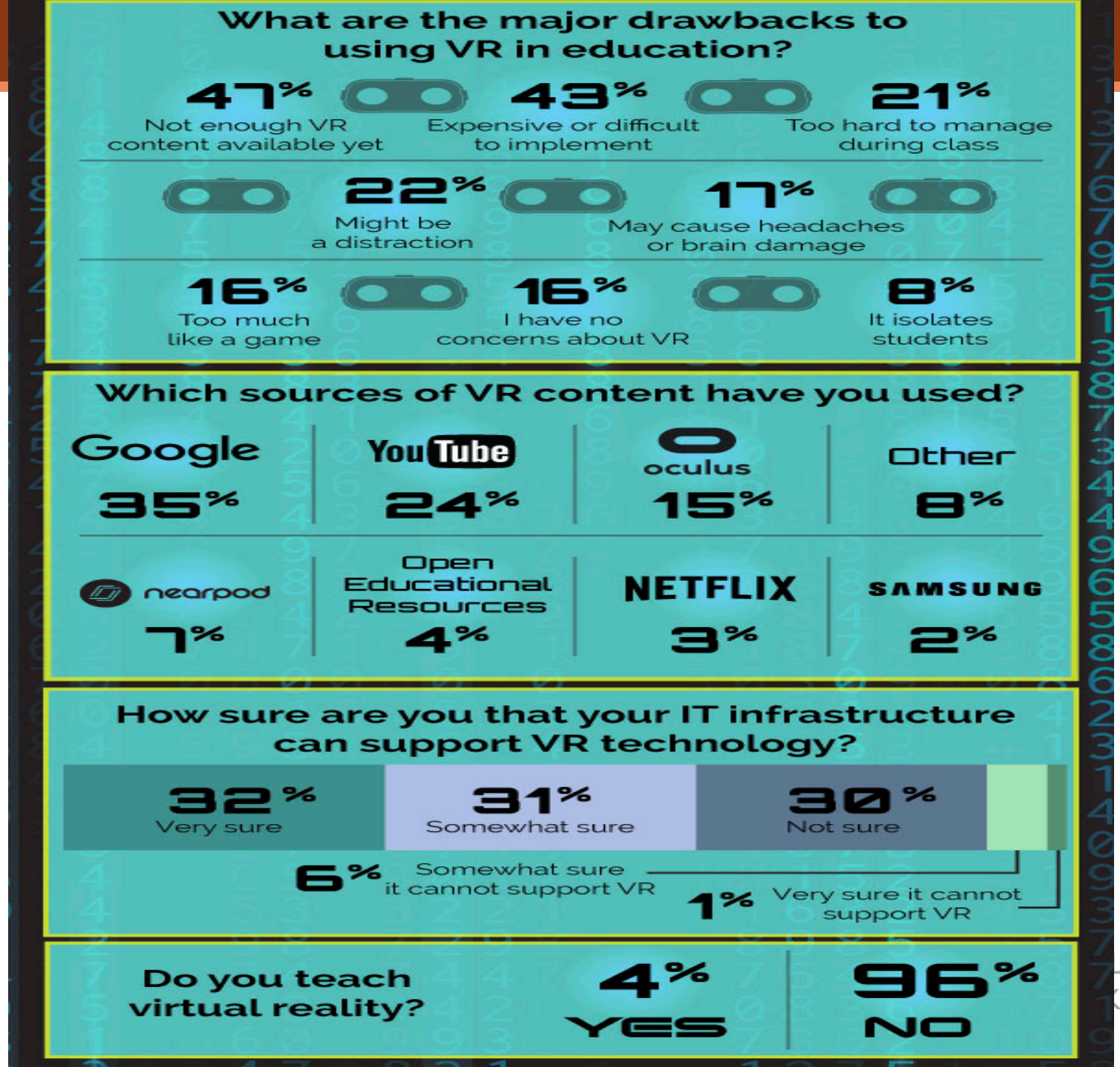


Do you expect or plan to use VR in the future?



What are the major benefits of using VR in education?




What are the major drawbacks to using VR in education?
47% Not enough VR content available yet
43% Expensive or difficult to implement
21% Too hard to manage during class
22% Might be a distraction
17% May cause headaches or brain damage
16% Too much like a game
16% I have no concerns about VR
8% It isolates students
Which sources of VR content have you used?
Google 35%
YouTube 24%
oculus 15%
Other 8%
nearpod 7%
Open Educational Resources 4%
NETFLIX 3%
SAMSUNG 2%
How sure are you that your IT infrastructure can support VR technology?
32% Very sure
31% Somewhat sure
30% Not sure
6% Somewhat sure it cannot support VR
1% Very sure it cannot support VR
Do you teach virtual reality?
4% YES
96% NO

德國 VR 在教室 調查

德國研究公司Kantar EMNID最近進行了一項調查，調研了來自德國各地的606名教師，以更好地了解教育工作者如何思考新技術（特別是虛擬現實）在教室中的應用。

三星支持的這項名為“VR在教室”的調查顯示，92%的受訪教育者支持在教室使用數位技術，而99%的30歲以下的教師贊成。根據調查，許多教師已經使用計算機，投影儀和筆記本電腦等設備，大多數教師（67%）使用這些設備教學沒有困難。

https://news.samsung.com/global/survey-shows-that-teachers-see-potential-for-virtual-reality-in-education

德國 VR 在教室 調查分析

教師們對使用虛擬現實（VR）有很大的興趣

- 18%的受訪者已經在私人或專業環境中使用虛擬現實技術，這項技術只有4%的學校使用
- 每兩個老師就有一個（48%）表示願意在課堂上嘗試
- 對於30歲以下的教師，這個數字相對較高，為58%

教師對於在學校使用新媒體時非常開明。

他們認識到使用數字技術（如VR）教學的發展潛力。因此有必要進一步去推動。現在是時候讓教師把VR帶進課堂中來了。

德國 VR在教室 調查分析

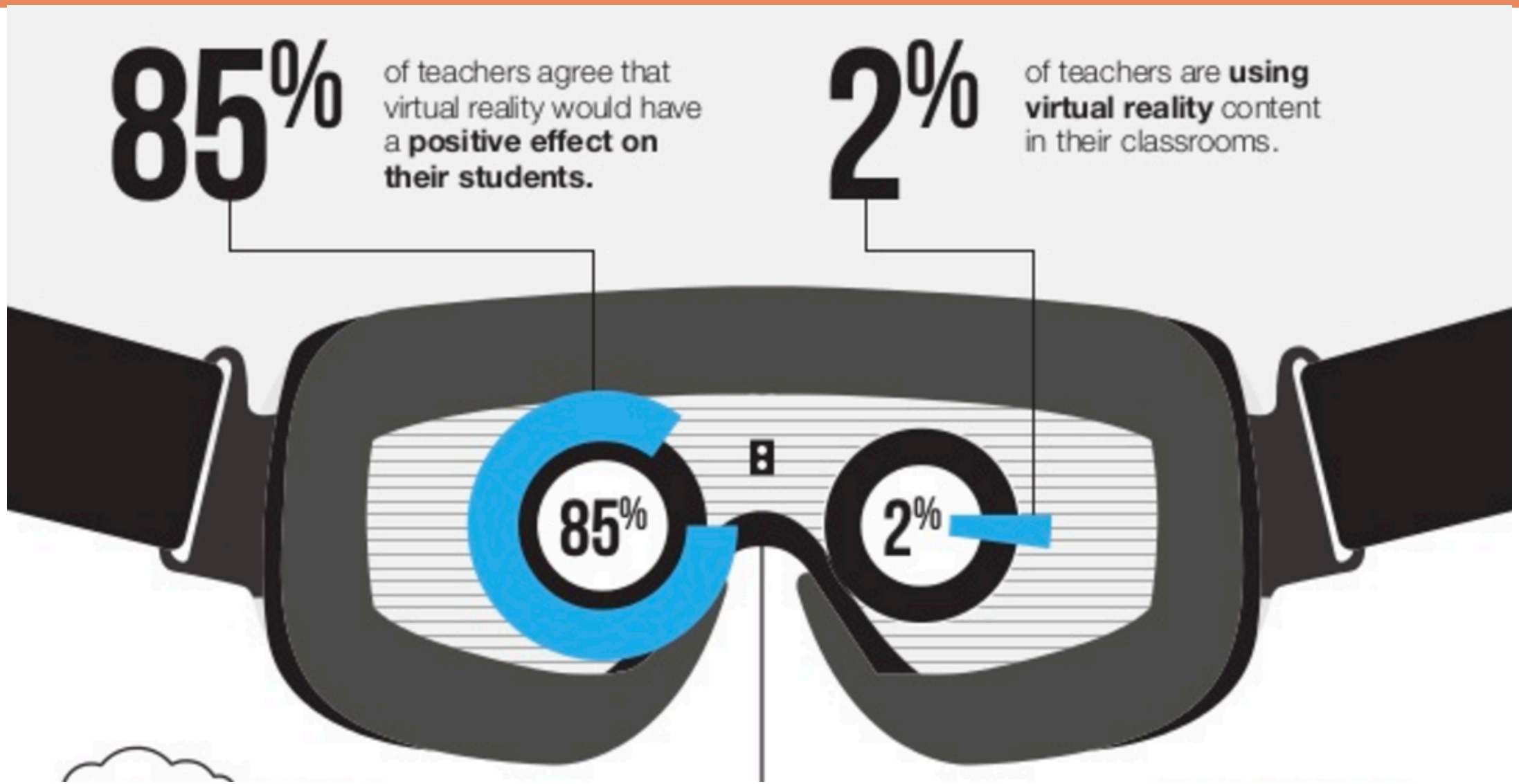
1. 超過四分之三的受訪教師（79%）同意 VR可以讓人體驗那些平常沒機會嘗試的事物。
2. 77%的受訪者認為VR是學生探索他們通常不能去的地方的恰當方式。
3. 除了體驗式教學，大多數教師認為在課堂上使用虛擬現實可以增加學生的學習動力（74%）和提高他們學習成功概率（62%）。
4. 58%的教育者也認為使用這項技術可以幫助學生更好地理解抽象的概念。
5. 根據受訪者，VR最適合的學科是地理（80%）、歷史（74%）和自然科學（62%）。
6. 幾乎一半的受訪教師（42%）相信它將在未來五年內在教室中使用。如果他們可以拿到設備，74%的教育者聲稱他們每個月至少一次會把VR用在教學中，而41%的教育者說他們每周至少使用一次VR。

中國：沉浸式VR（虛擬現實）技術在基礎教育如何應用

目前針對基礎教育教學所開發的虛擬現實技術資源很少，課程資源短缺是中小學推廣VR的瓶頸；VR技術的運用勢必帶來課堂教學方式的顛覆性改變，由於需要教師顧及到每位學生，因此只適用於“一對一”的小班化教學，弱化了普通課堂中的合作和交流；另外，使用VR技術缺少監控，無法記錄學生的實際學習狀況，對學生的評價也存在很大的困難。

《中國教育報2017》

http://www.jyb.cn/theory/jysd/201609/t20160924_674885.html


85%
of teachers agree that virtual reality would have a positive effect on their students.
2%
of teachers are using virtual reality content in their classrooms.
85%
2%

Virtual REALITY IN EDUCATION IN 2017

Virtual Reality IN Education CEREBRUM Inc

97% of students would like to study a VR course

2016 Augmented and Virtual Reality Survey Report

EDUCATION is expected to be the **4th** **BIGGEST SECTOR** for VR investment

VIRTUAL & AUGMENTED REALITY:

Understanding The Race For The Next Computing Platform Goldman Sachs Report

VR IN EDUCATION

is predicted to be a **$200 MILLION** industry by 2020 and a **$700** million industry by **2025.**

THE STATE OF TECHNOLOGY IN EDUCATION REPORT 2016

Almost 80% of teachers have access to virtual reality devices, but these are used regularly by only 6.87% of teachers

SAMSUNG SURVEY OF U.S. K-12

Educators' Opinions and Usage of Virtual Reality

93% of teachers said that there students would be excited to use virtual reality

7 OUT OF 10 TEACHERS want to use VR to simulate experiences relevant to the material being covered

49% of high school teachers would like to use VR to allow students to visit college campuses to encourage further education

69% of teachers said that they would use VR to allow students to visit distant locations

Infographic created by: Virtual Reality Brief www.VirtualRealityBrief.com

THE STATE OF VIRTUAL REALITY FOR BUSINESS IN 2017

30%

Of Consumer-Facing Companies In The Forbes Global 2000 Will Experiment With AR And VR **As Part Of Their Marketing Efforts In 2017**

In a high-adoption scenario, the economic impact of VR/AR is forecast to amount to **29.5 billion U.S.dollars in 2020.**

Goldman Sachs predicts Virtual Reality will be an **$80 billion market in 2025**

Goldman Sachs

The number of companies planning to include Virtual Reality in their businesses

375% between **2016** & **2015**

There were 271 AR / VR exhibitors at the CES trade show, the largest number ever.

China's VR industry is predicted to grow to **56.63 billion** Yuan by 2020 a **105%** growth rate according to PWC.

81% of content marketers believe that interactive content like VR grabs attention more effectively than other types of content.

Simulation exercises, employee training and computer modelling are the **3 areas** that enterprises are most interested in using VR for.

VR Virtual Reality

Infographic created by: Virtual Reality Brief www.VirtualRealityBrief.com

Augmented Reality 擴增實境

- Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics.

https://en.wikipedia.org/wiki/Augmented_reality

擴增實境（Augmented Reality）

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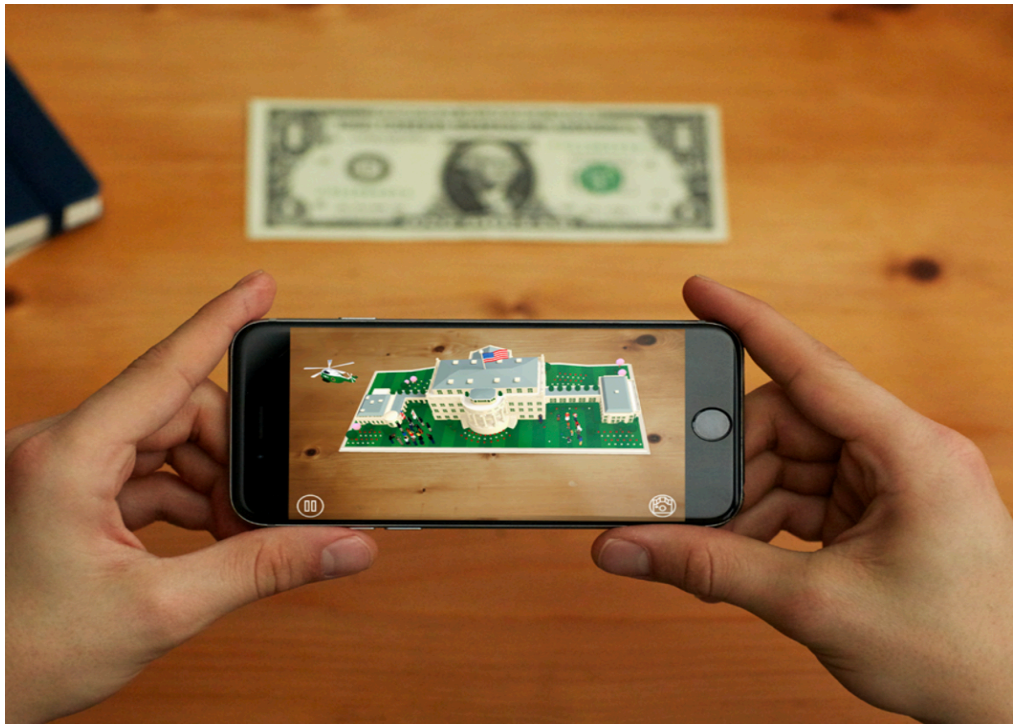
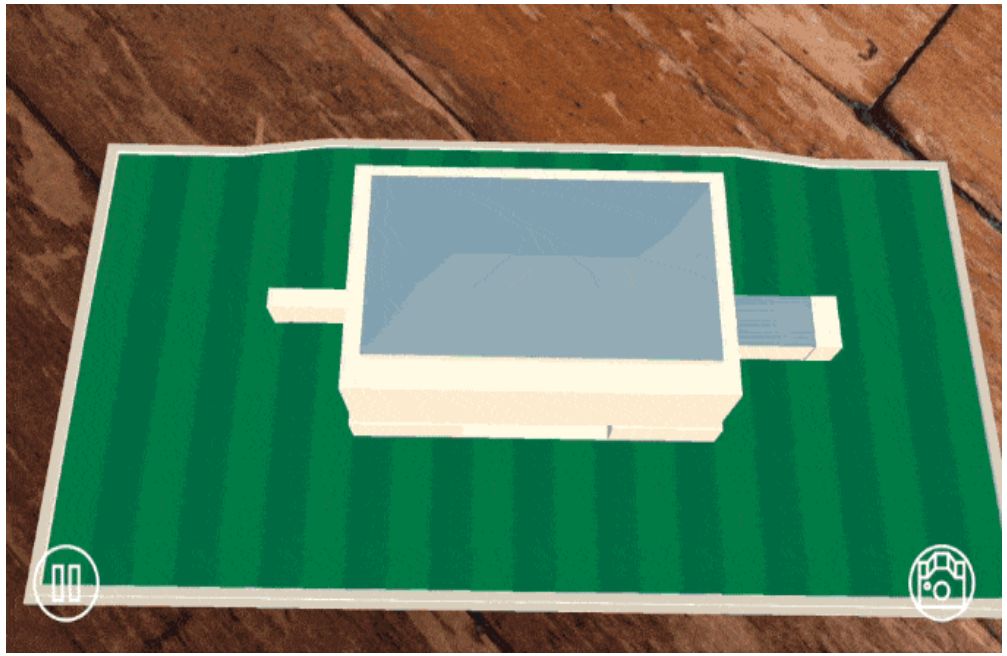




擴增實境（Augmented Reality）

https://www.hpreveal.com/

Properties of AR

- AR adds Information to a real object
- AR is about the ‘here and now’
- AR can be a shared experience
- AR is triggered by markers

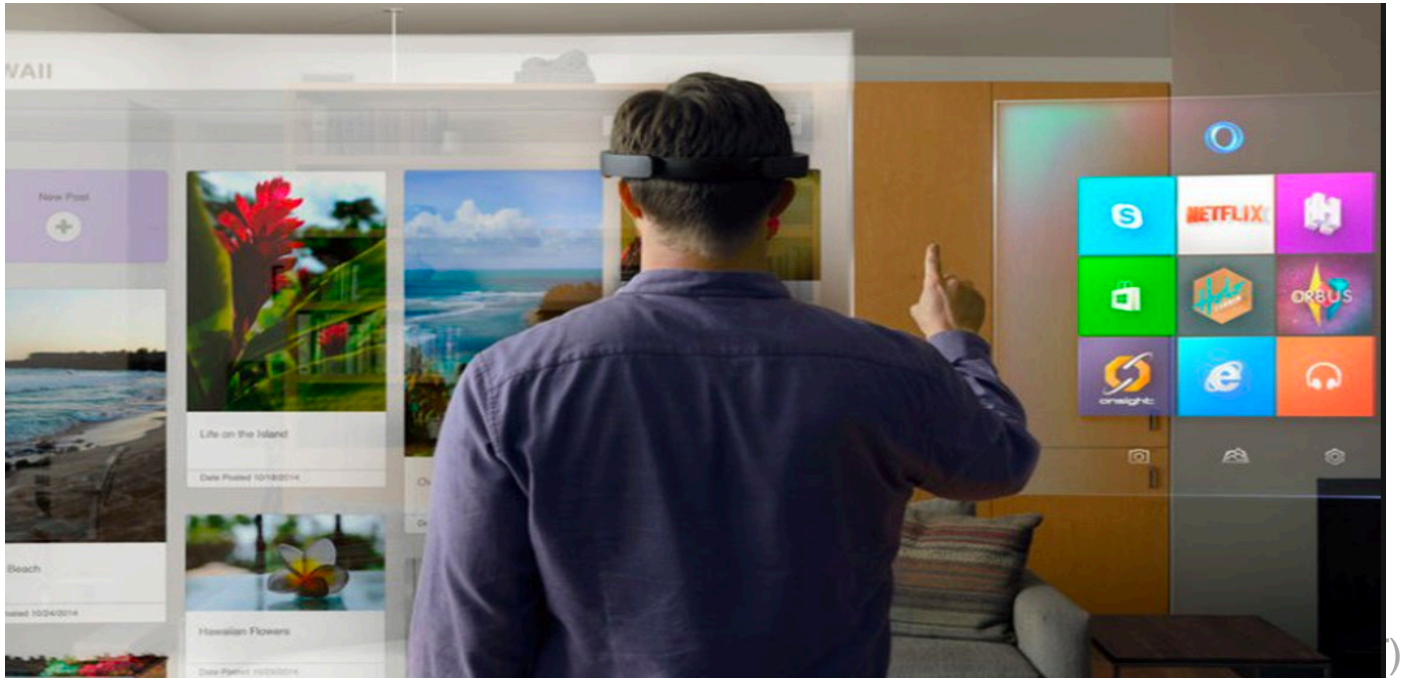
Applications for AR

- Mobile companion apps
- Entertainment
- Advertising
- Navigation

混合實境 (Mixed Reality)

Mixed reality (MR) is the merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time.

https://en.wikipedia.org/wiki/Mixed_reality

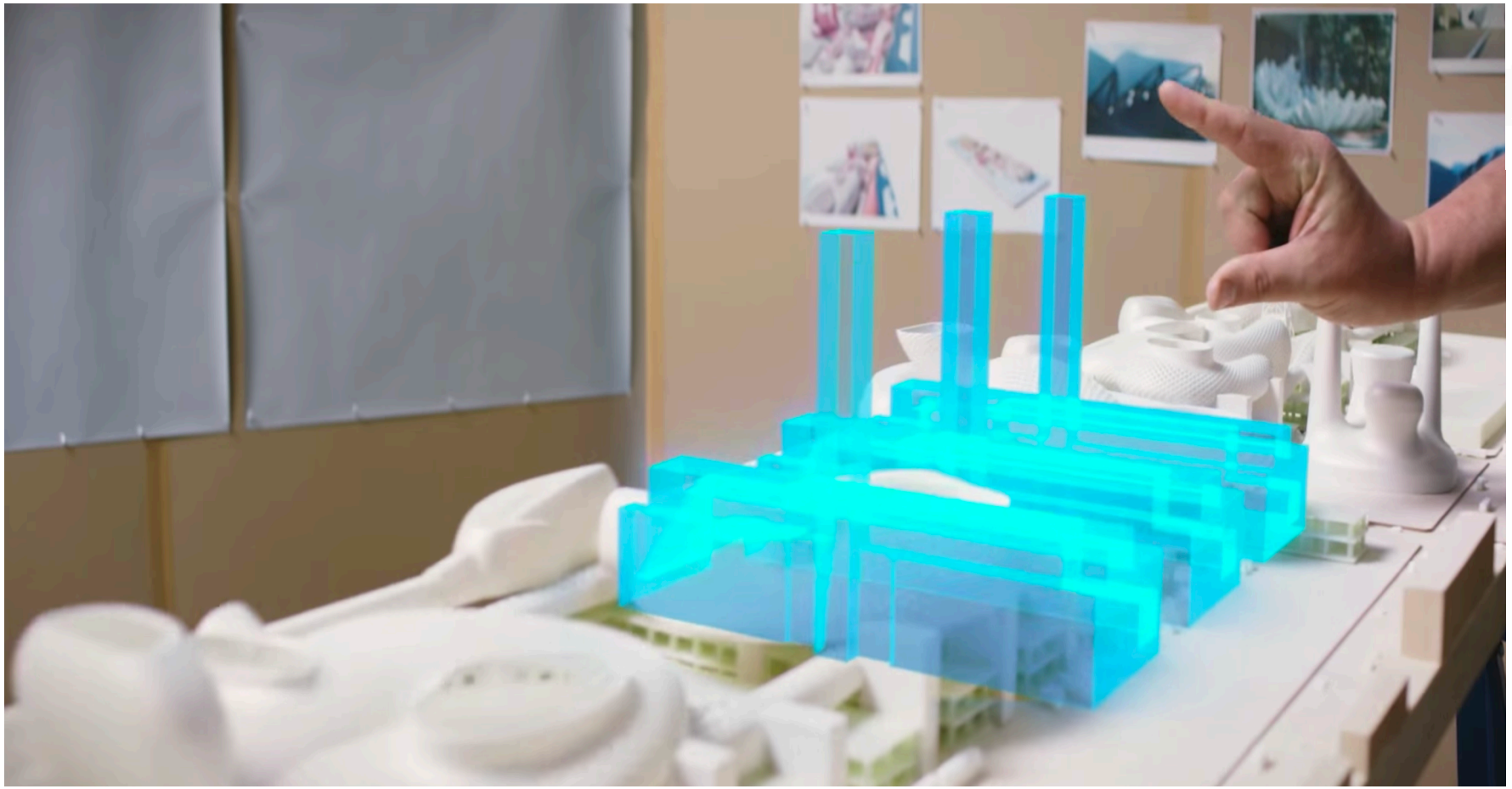


Properties of MR

- MR ‘extends’ AR
- MR matches the geometric properties of real objects & space
- MR does not require markers
- Interaction with real space affects virtual space

Microsoft HoloLens

Microsoft HoloLens



Microsoft HoloLens

https://youtu.be/GjZgI2oDcwM

Microsoft HoloLens

2. Techniques and Essential Skills of Using VR Equipment

Capture 拍攝 → Cloud 儲存 → View 觀看

360° YouTube

Filming Plan and Preparation

- Route planning and how to optimize the route
- Time management
- Film duration management

名稱	Videostitch Orah 4i	LG 360 CAM	Ricoh Theta S	Ricoh Theta M15	Samsung Gear 360	Kodak Pixpro SP360
照片						
相機數目	4	2	2	2	2	1
相機參數	三星感光元件	雙面各1300萬畫素(206° 魚眼	1/2.3 CMOS x2	CMOS x2	CMOS, 15.0 MP x2	1752 萬像素 1/2.3 吋 CMOS
解析度	4096x2048 H.264 (4K)	照片規格 360 ° Max. 5660 x 2830 180 ° Max. 2468 x 1388 影片規格 360 ° Max. 2560 x 1280 @30fps 180 ° Max. 1536 x 1152	照片規格 5376 x 2688 2048 x 1024 影片規格 1920 x1080/30 fps/16 Mbps 1280 x720/15 fps/6 Mbps	未知	影片規格 3840 x 1920 @30fps	照片規格 3264 x 3264 影片規格 1920 x 1080 @ 30fps
直播	有	無	有	無	無	無
售價	訂價 US $3,595 優惠價 US $1,795	NT $8,900元	NT $13,900元	NT $11,900	US $399.99	NT $10,990

名稱	Kodak PIXPRO SP360 4K	Kodak PixPro 4KVR360	Giroptic 360 Cam	Insta360 4K	Insta360 Nano	Insta360 Air
照片						
相機數目	1 or 2	2(235 度/ 155 度)	3	2	2	2
相機參數	1276 萬像素 1/2.33 吋 CMOS	BSI CMOS 2000萬畫素*2	未知	Sony 800萬像素 CMOS	F2.0	F2.4
解析度	照片規格 3840 x 2160 影片規格 2880 x 2880 @ 30fps 3840 x 2160 @ 30fps	照片規格 2700萬畫素球型相片 影片規格 15fps的4K影片	照片規格 4096 x 2048 影片規格 2048 x 1024 @30fps	影片規格 4K（4096x2048） @18fps 3K（3072x1536） @25fps 2K（2048x1024） @30fps	影片規格 3040 * 1520	照片規格 3040x1520(3K) 影片規格 2560x1280(2K)
直播	無	無	有	有	有	有
售價	單機 NT $15,990 元 雙機組 NT $34,990 元	NT $20,400	US $499.99	¥4,500元	NT $7,990	US $99

RICOH Theta S

Live Streaming

RICOH Theta S

Mass Storage

RICOH Theta S

Insta360 S

https://www.insta360.com/product/insta360-one/

ogies (CLST)
f Hong Kong

考慮因素

5.7K影片+18MP照片

FlowState 防震技術

360°拍攝

慢動作

隱形自拍杆

Wi-Fi連接

移動延時攝影

HDR

ogies (CLST)
f Hong Kong

360-DEGREE Photo Capturing Skills

- Composition of picture
- Device levelling
- Lighting techniques (sunlight, weak light, halogen light, etc.)
- The Dynamic Range Theory and its application

360-DEGREE Video Capturing Skills

How to choose the right filming spot by considering:

- Accessibility and Safety
- Illumination
- Points of interest

Voice Recording Techniques:

- Camera Internal Microphone Recording (Pros and Cons)
- External Microphone Recording (Pros and Cons)

Instructional Design and Implementation of 360-DEGREE Videos

1. Camera-speaking techniques
2. How to motivate students
3. How to design interactive activities
4. Strategic pauses
5. How to make good use of the environment to achieve learning goals
6. Promoting students' collaboration and interaction
7. The Inquiry-based Learning Approaches
8. How a long video should be divided to fit students' expectation
9. How to cater students' individual learning differences.

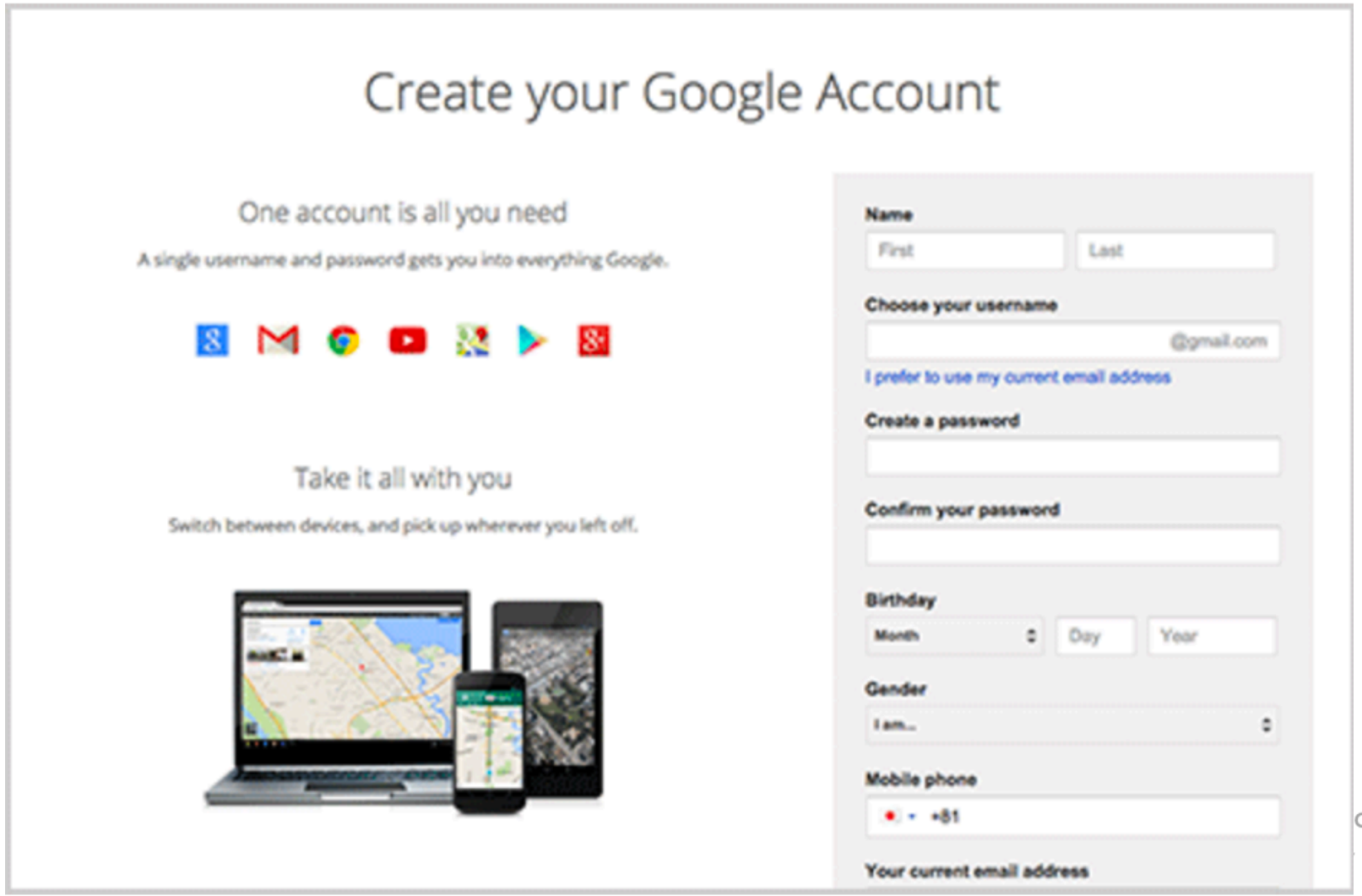
Capture 拍攝 → Cloud 儲存 → View 觀看

360° YouTube

單元: YouTube 的 360 度影片和虛擬實境技術

https://creatoracademy.youtube.com/page/lesson/spherical-video?cid=360video&hl=zh-TW

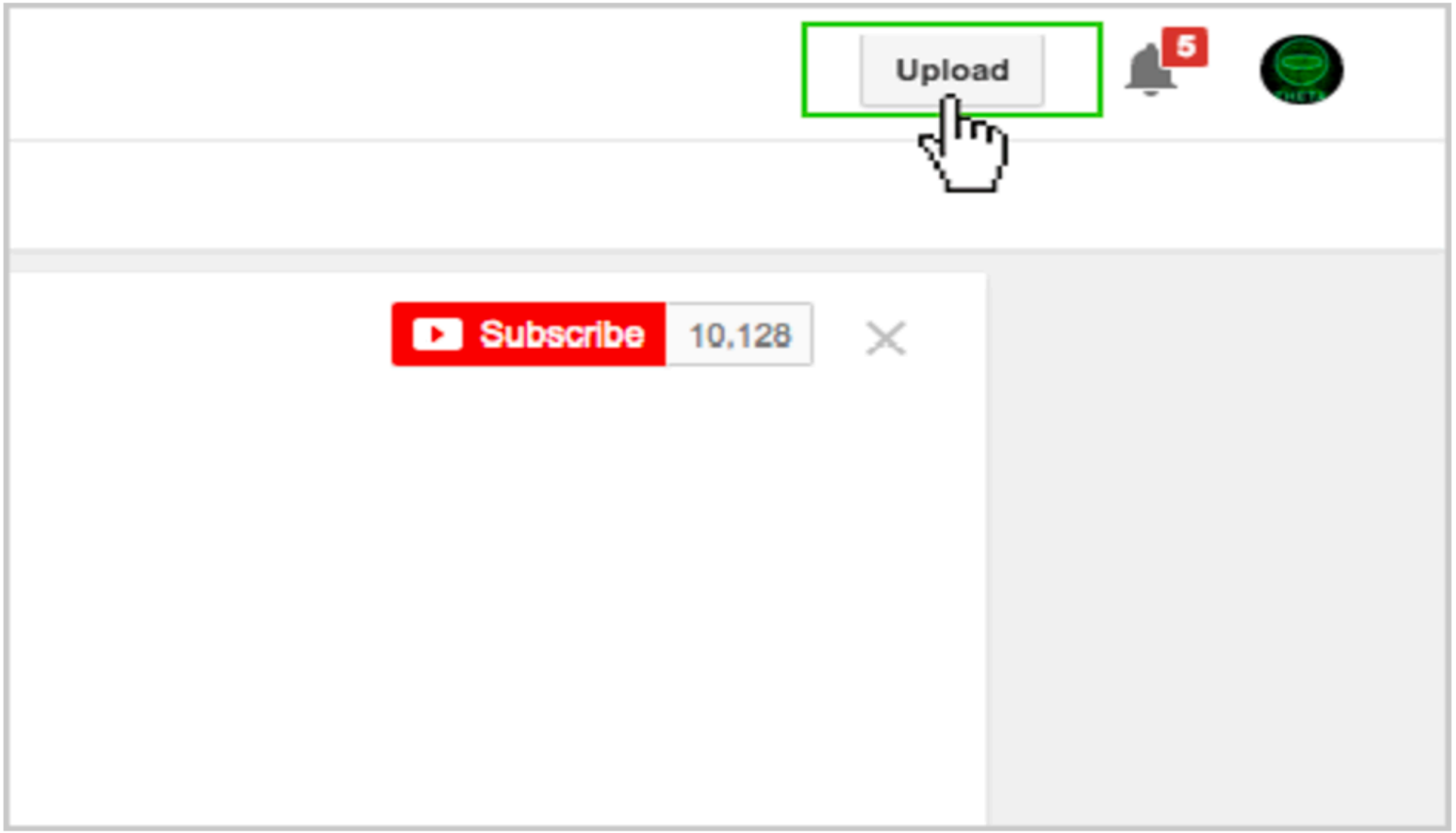
STEP 1 : Create a Google account



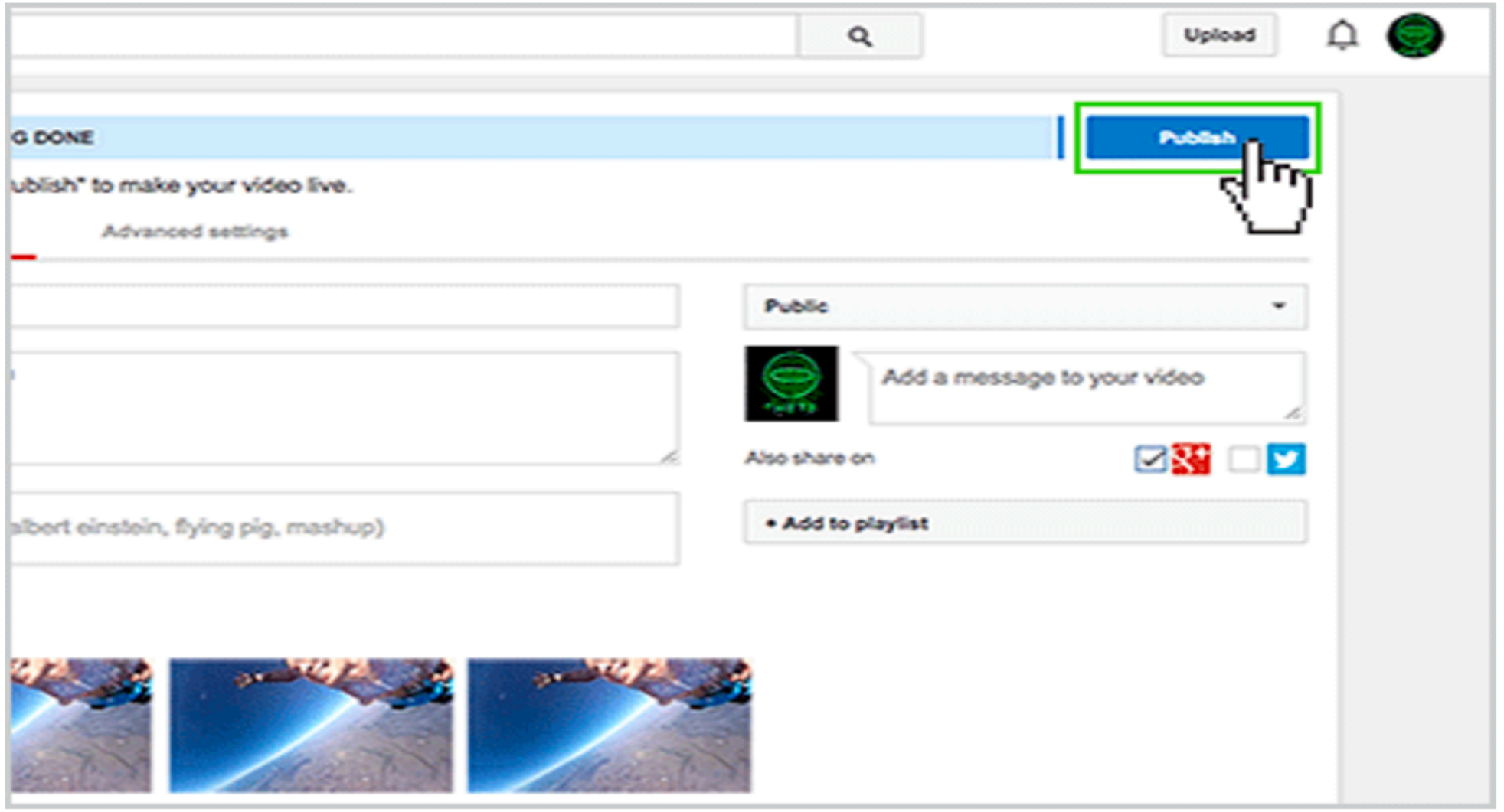
STEP2:
Capture a video using VR360 cam and import it to the computer

STEP3: Set the Privacy Setting of 360 Video

STEP4: Login to YouTube, and click the "Upload button" at the top right



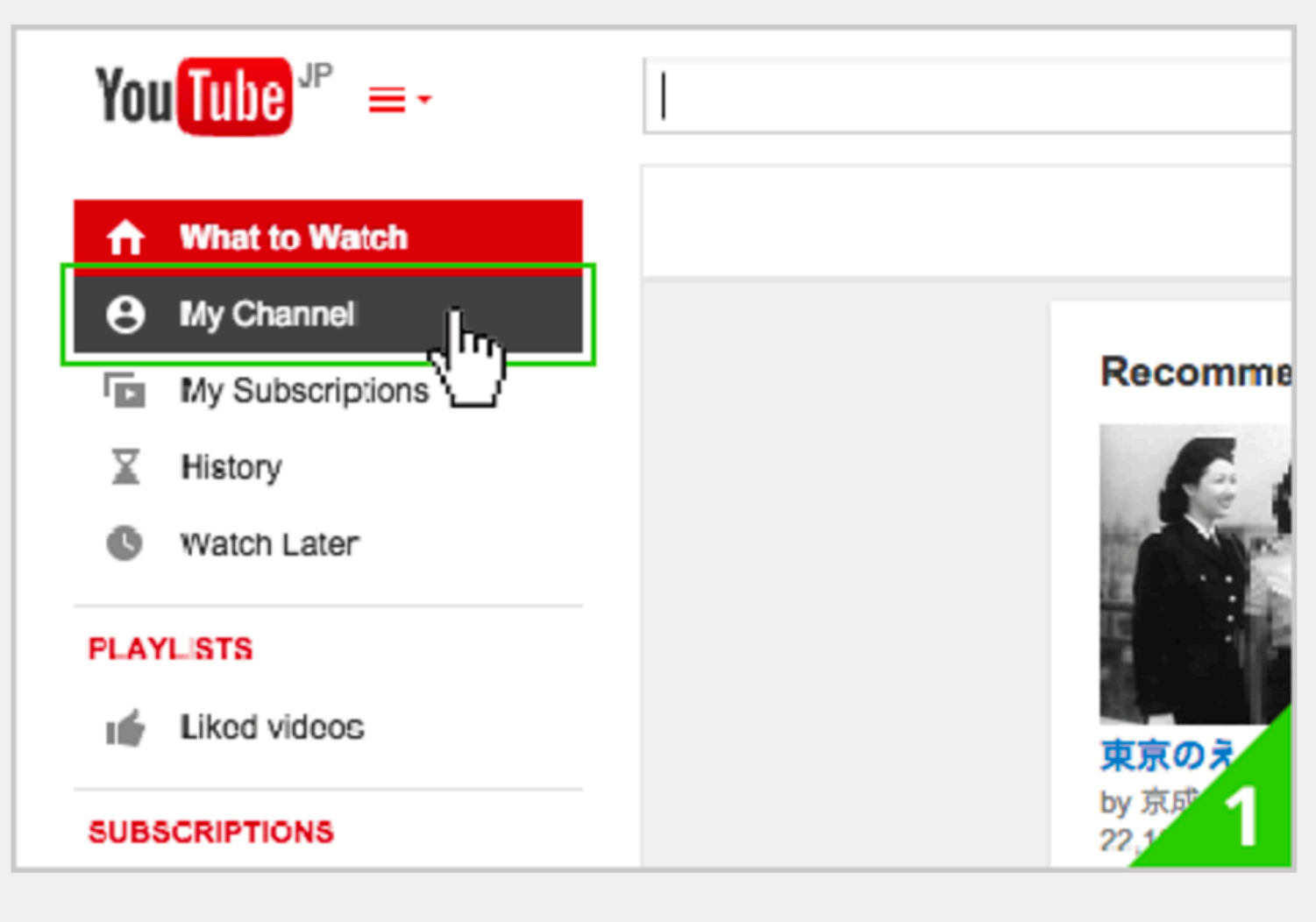
STEP5
Click the "Publish button", and done!



Upload 360-degree video/ photo

Ricoh Theta

How do I check the videos I have posted?



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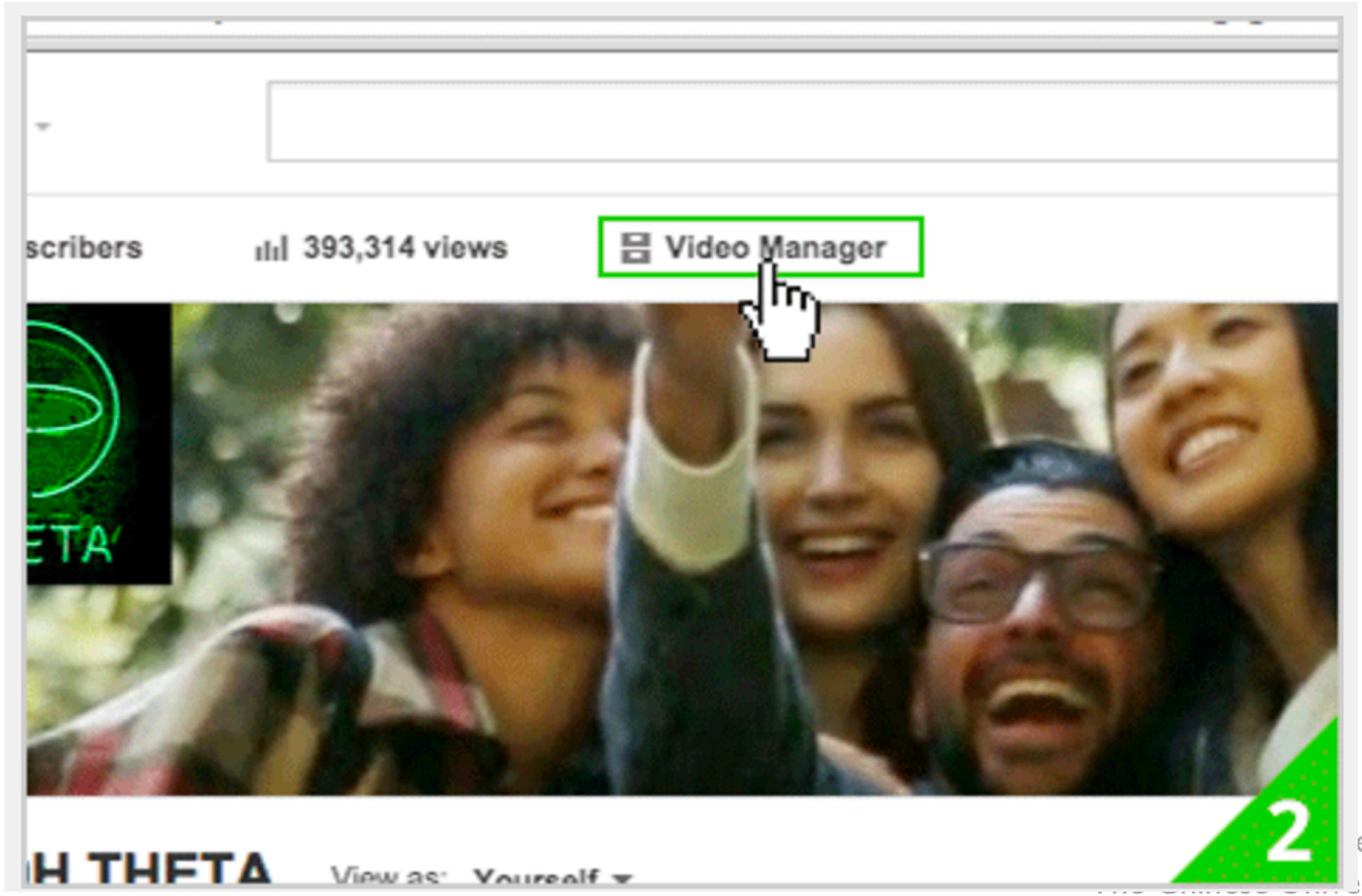

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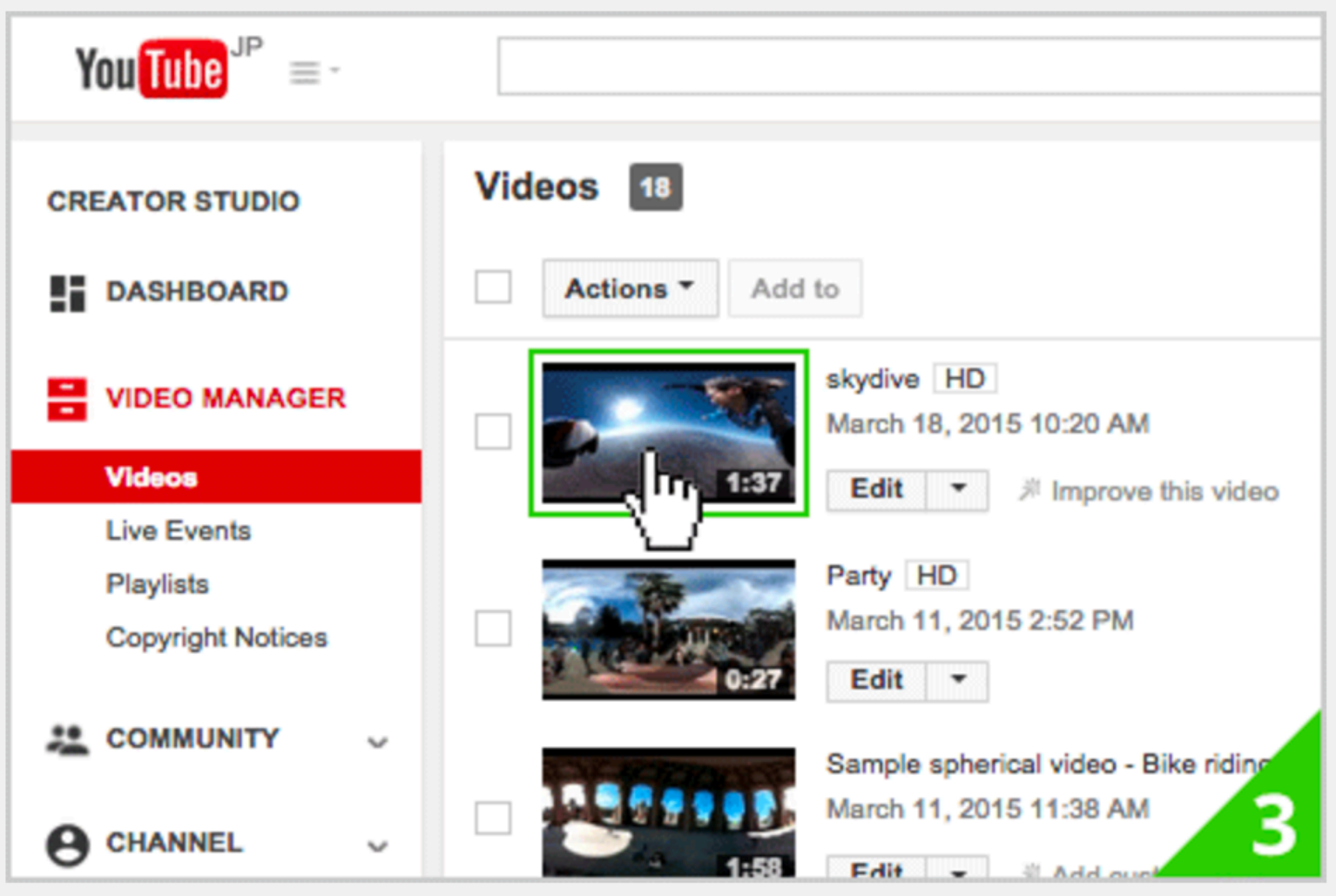
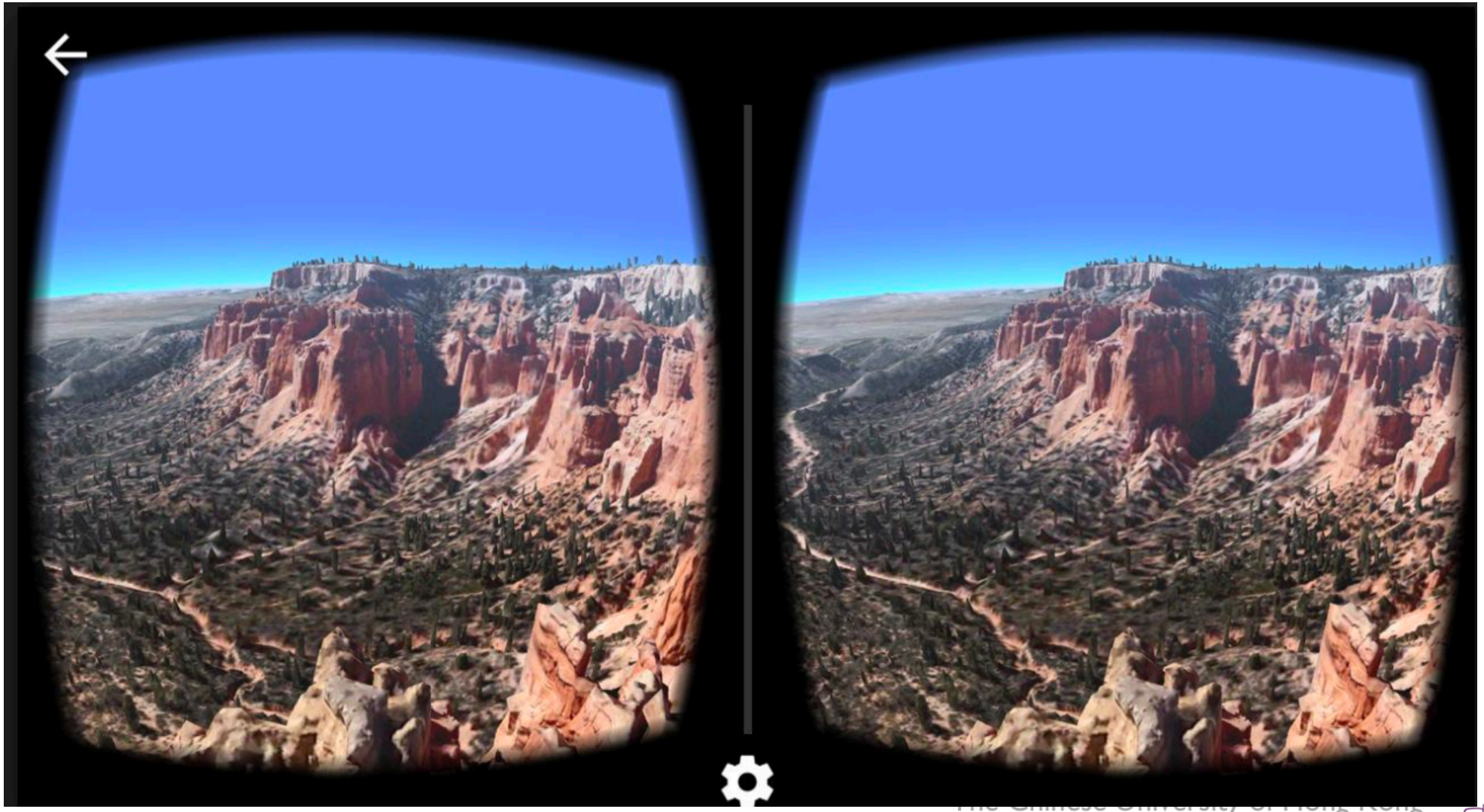


Capture 拍攝 → Cloud 儲存 → View 觀看

360° YouTube

VR Viewing



Head-Mounted-Displays (HMDs)

Google Cardboard

HK$10

For all phones
Glasses: Merely

- Cheap
- Light
- Acceptable FOV

- Poor build quality
- Limited life span
- Discomfort
- Poor light isolation
- Nausea

Taobao Headset

HK$50-200

For all phones
Glasses: OK

- Focal length and pupillary distance customizable

- Low FOV in some models
- Limited light isolation
- Heavy
- Hair Style Tangle

Google Daydream View

HK$690

Androids
Glasses: OK

- Good light isolation
- Good FOV

- High cost
- Only works on Androids

Samsung Gear VR

HK$510

New Samsung Phones
Glasses: OK

- Perfect light isolation
- Good FOV

- High cost
- Only works on particular Samsung phones
- “hacking” needed for 3rd party apps

HTC Vive

HK$6,750

For PC only
Glasses: OK

- Perfect light isolation
- Good FOV
- Highly Immersive

- Extreme High cost
- Extra space needed for installation
- Hard to setup and maintain

Head-mounted-displays

- 只要把用戶的眼鏡完全對準顯示器，就足夠創造出一個半沉浸的虛擬世界了。
- 而VR頭盔為了盡可能的增強虛擬效果，通常要增加畫面寬度。目前高端的頭盔通常可以做到100或者110度的視野。
- 而為了讓人得到最佳的體驗，整個畫面的幀率要保持在至少60幀每秒，當然高級的頭盔可以達到更高，比如Oculus的90fps，SONY PlayStation VR的120fps 。

Field of View (FOV)視野 and Level of Immersion 沉浸感

Field of View (FOV) and Level of Immersion

- Field of view, or the extent of the observable environment at any given time, is one of the more important aspects of virtual reality.

- The wider the field of view, the more present the user is likely to feel in the experience.

- There are two types of FOV that work together to form human vision.

Field of View (FOV) and Level of Immersion

- Monocular FOV describes the field of view for one of our eyes.
- For a healthy eye, the horizontal monocular FOV is between 170°-175° and consists of the angle from the pupil towards the nose, the nasal FOV which is usually 60°-65° and is smaller for people with bigger noses, and the view from our pupil toward the side of our head, the temporal FOV, which is wider, usually 100°-110°.

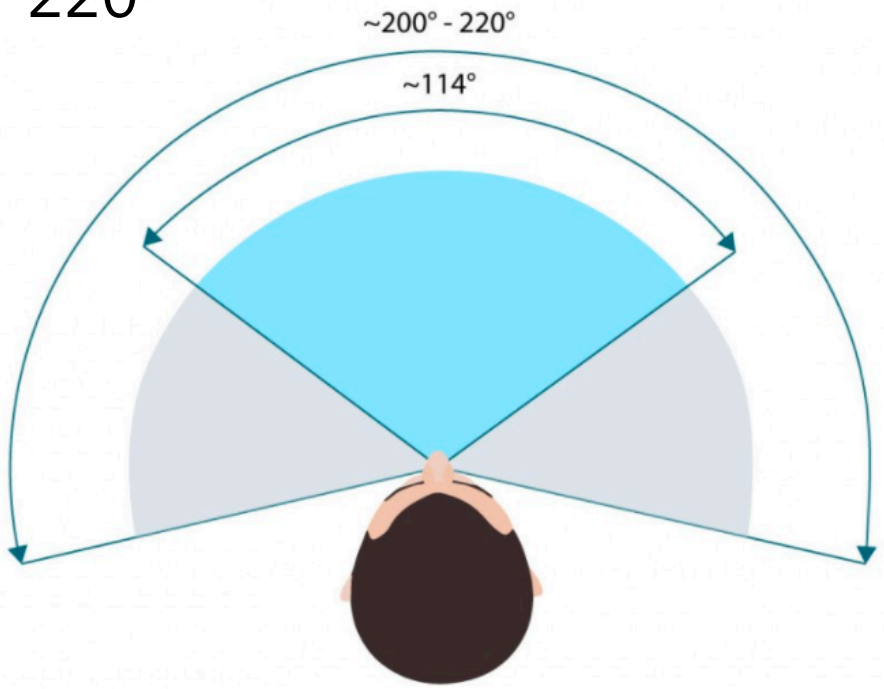
Field of View (FOV) and Level of Immersion

- Binocular FOV is the combination of the two monocular fields of view in most humans.

- When combined they provide humans with a viewable area of 200°-220°. Where the two monocular fields of view overlap there is the stereoscopic binocular field of view, about 114°, where we are able to perceive things in 3D.

Field of View (FOV) and Level of Immersion

Monocular FOV : 100°-110°
Binocular FOV : 200°-220°

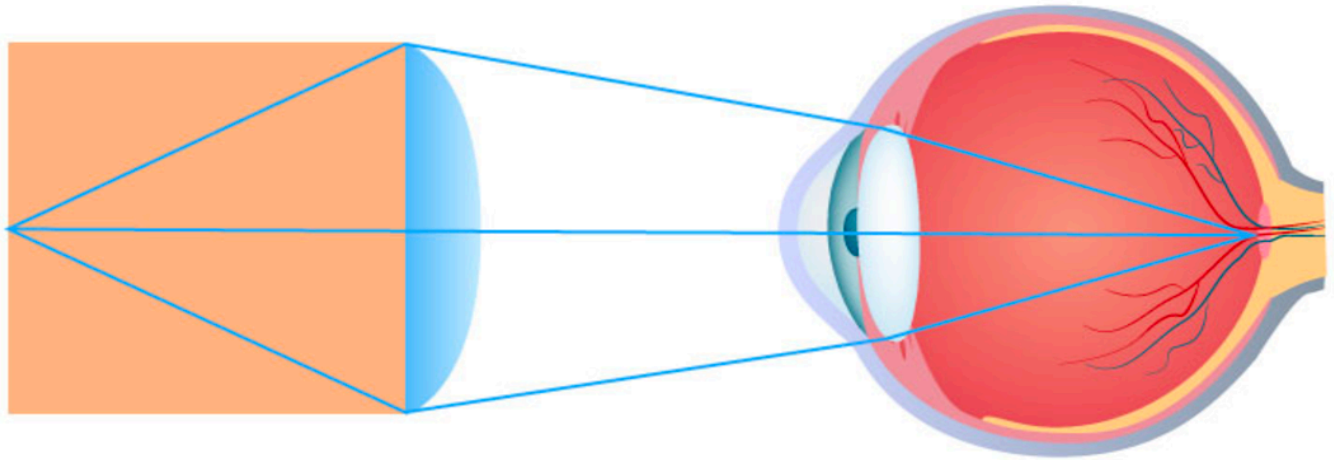


chnologies (CLST)
sity of Hong Kong

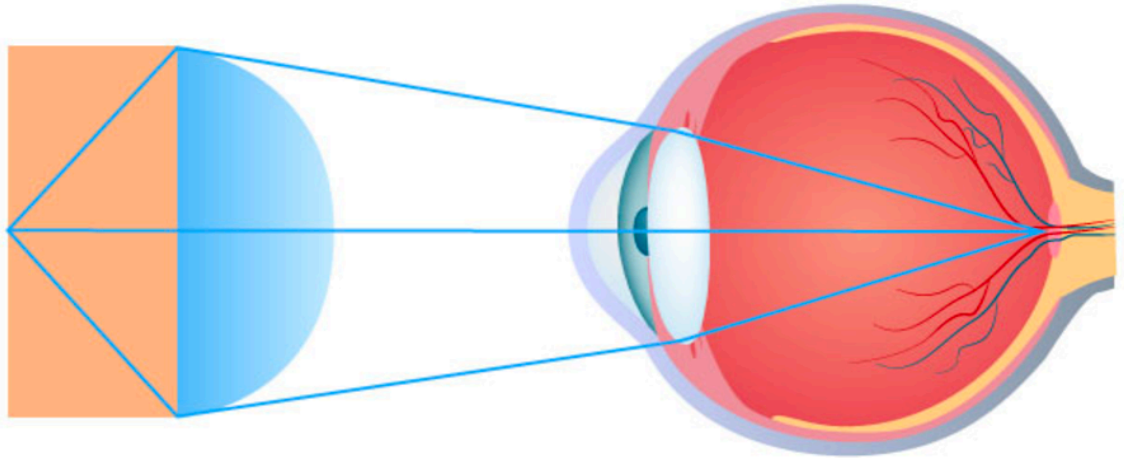
Field of View Considerations for Virtual Reality Headset Manufacturers

- When it comes to VR FOV the limiting factor is the lenses, not the pupils.
- To get a better field of view you either move closer to the lenses or increase the size of the lenses.
- Companies like Oculus and HTC want to make the lightest and smallest headsets possible for ergonomic reasons.

A) Thinner lens, bigger VR HMD



B) Thicker lens, smaller VR HMD



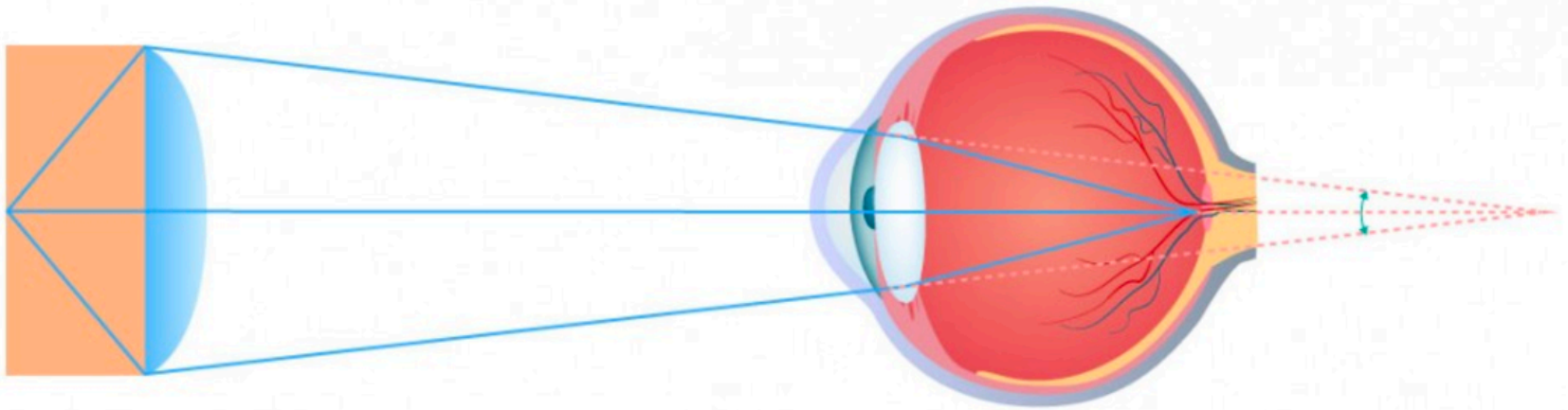
Field of View Considerations for Virtual Reality Headset Manufacturers

- You can use thin lenses that are light in your VR headset but this will increase the distance you need to have from the lenses to the VR headset display and thereby the size of the headset (A)

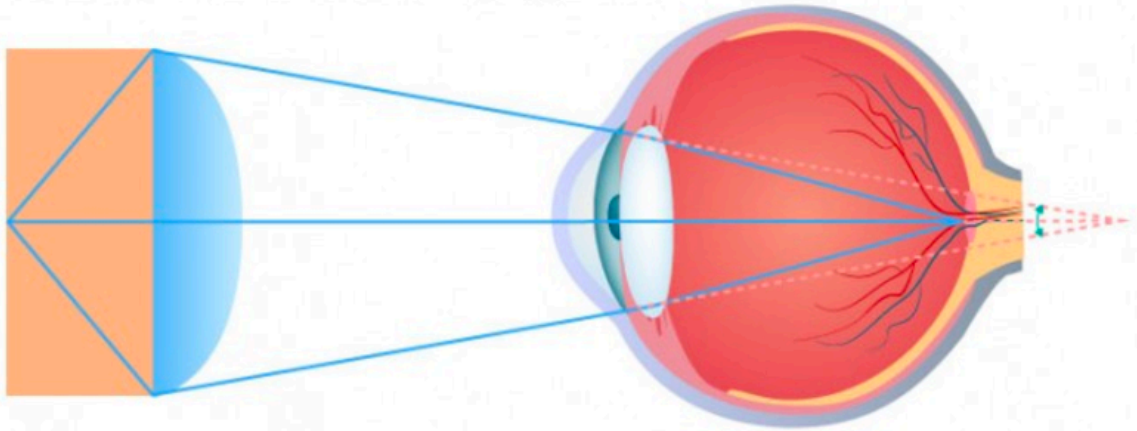
- You can use thicker lenses (with a shorter focal length for a stronger magnification) and move the display closer but those thicker lenses add new engineering challenges to keep geometric distortion and chromatic aberration under control.

- Due to the stronger magnification a higher resolution display is needed as well to avoid or reduce the screen door effect (in which you see individual pixels) (B).

C) Thinner lens, more distance, smaller FOV



D) Thicker lens, less distance, bigger FOV



Field of View Considerations for Virtual Reality Headset Manufacturers

- Another option if you want to keep the headset at a fixed size is to add more distance between the VR headset lenses and the user's eyes (C).

- This reduces the FOV and is not desirable as well so what we see right now is mostly smaller headsets with thicker lenses that are fairly close to the user's eyes (D).

Watch 360 degree videos in Cardboard

Google Cardboard lets you experience virtual reality in a simple and fun way. With Cardboard and the YouTube mobile app, you can even watch 360 degree videos for an immersive experience.

1. Get Google Cardboard and assemble it
2. Open the YouTube app
3. Go to the 360Video house channel by searching for "#360Video" and visiting the channel. You'll know it's the right one if it has this avatar:
4. Pick a video on the channel, and start playback
5. Tap the cardboard icon . You'll notice that the screen splits into two smaller screens
6. Insert your phone into Cardboard
7. Look around to view the video in 360 degrees

Watch 360 degree videos in Cardboard

Google Streetview

Discovery VR

Within - VR (Virtual Reality)

Google Cardboard

Watch 360 degree videos in Cardboard

Google Expeditions

Google Expeditions enable teachers to bring students on virtual trips to places like museums, underwater, and outer space. Expeditions are collections of linked virtual reality (VR) content and supporting materials that can be used alongside existing curriculum.

These trips are collections of virtual reality panoramas — 360° panoramas and 3D images — annotated with details, points of interest, and questions that make them easy to integrate into curriculum already used in schools.

Watch 360 degree videos in Cardboard

Google Expeditions

Google is working with a number of partners, including: WNET, PBS, Houghton Mifflin Harcourt, the American Museum of Natural History, the Planetary Society, David Attenborough with production company Alchemy VR and many of the Google Cultural Institute museum partners to create custom educational content that spans the universe.

3. VR Design and Implementation for Learning and Teaching

VR Design and Implementation

Steve Bryson Computer Science Corporation/NASA Ames Research Center Moffett Field, Ca Approaches to the Successful Design and Implementation of VR Applications, https://pdfs.semanticscholar.org/a260/b6d6a5702e0f6e8186576750975a8ef05116.pdf

For environments in which objects move only under user control:

- (Visual display constraint) The visual images must be presented to the user with a frame rate of at least 10 frames per second.
- (Interactivity constraint) The lag time from when the user provides an input to when that input is reflected in the environment should be less than 0.1 seconds.

VR Design and Implementation

For environments which contain fast moving objects:

- (Visual display constraint) The frame rate should be greater than three times the highest frequency of motion of the objects in the environment.
- (Inertactivity constraint) The lag times should not be longer than the time of a single graphics frame.

4. VR Lesson Design and Implementation

VR Lesson Design and Implementation

http://www.classvr.com/category/virtual-reality-teacher-lesson-ideas/

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06 DEC

Creating Virtual Reality Content Using ClassVR

Creating Virtual Reality Content Using ClassVR As teachers, we know that creativity is at the heart of everything we do – whether it's in creative writing, art, music or drama – or even maths and science. However, digital literacy is now becoming one of the most important features of the school curriculum, and being creative [...]

Posted in: Virtual Reality Teacher Lesson Ideas

08 NOV

Virtual Reality and Remembrance Day

Virtual Reality and Remembrance Day 2018 marks 100 years since the end of the Great War. One of the bloodiest conflicts of human history, the First World War brought with it unprecedented levels of destruction and by the time the guns fell silent in 1918 it had claimed over 16 million lives. Teachers across the [...]

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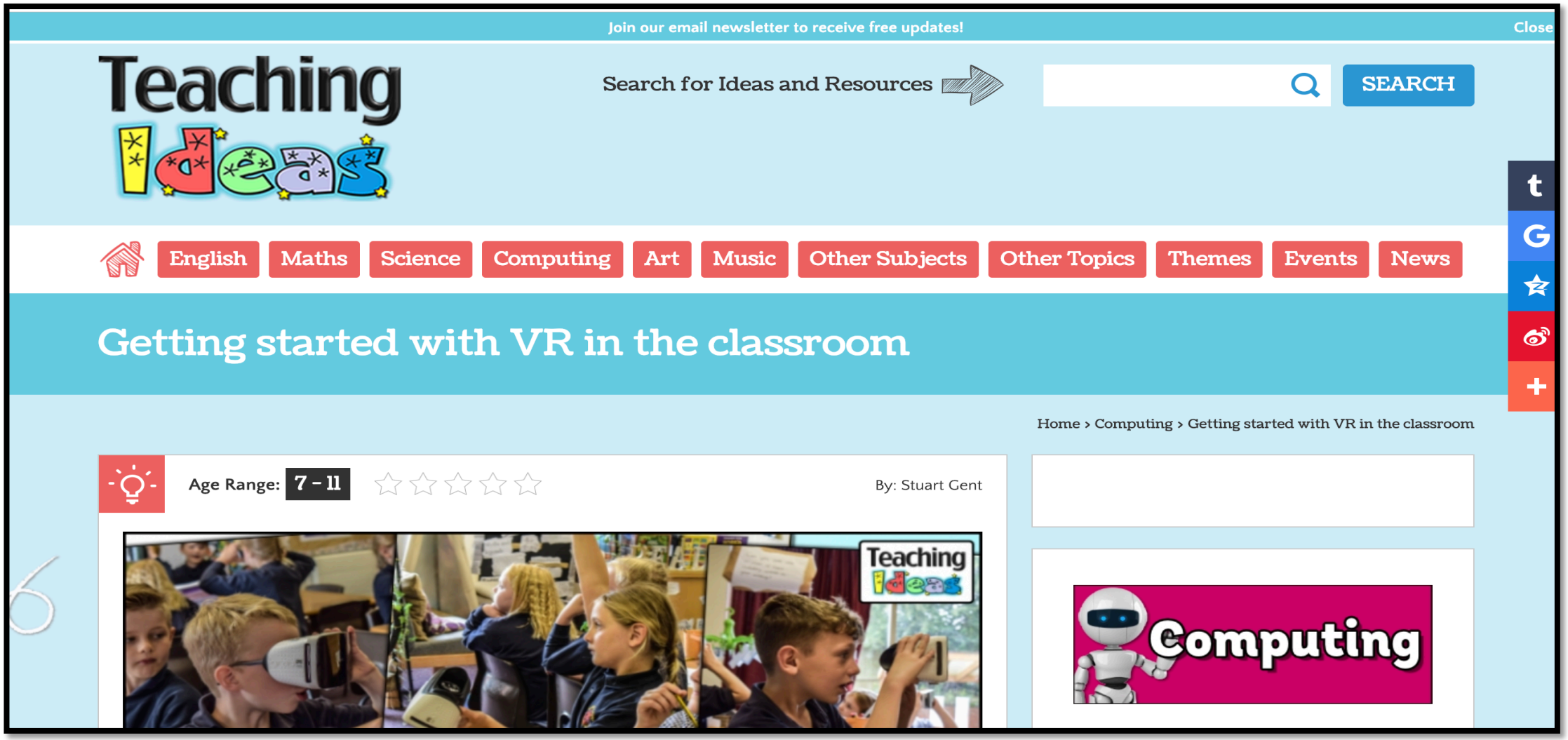
September 13, 2018

INTERNATIONAL LITERACY DAY – 8TH SEPTEMBER 2018
September 5, 2018

CLASSVR VIDEOS ARE HERE! August 28, 2018

VR Lesson Design and Implementation

https://www.teachingideas.co.uk/computing/getting-started-with-vr-in-the-classroom



VR Lesson Design and Implementation

- 中文科
- 英文科
- 數學科
- 互外考察

5. In Depth VR Lesson Case Studies and How They Enhance L&T Effectiveness
6. Discussion of Assignment