

Re-Evolution of education: Metaverse learning and online collaboration in the post-COVID-19 era 後疫情時代的元宇宙學習與線上協作

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President of Dong Hwa University

2021/11/18

2022 、 2021 University Rankings

| Category | Rankings | Ranked (World) | Ranked (Taiwan) |
|----------|--|--|-----------------|
| World | THE World University Rankings 2022 | 1,000-1,200 | 12 |
| | QS World University Rankings 2022 | 1,001-1,200 | 15 |
| | THE Impact Rankings 2021 | 401-600 | 11 |
| | 2021 WURI Global Top 100 Innovative Universities | 101-200 | 1 |
| | 2021 WURI Crisis Management | 10  | 1 |
| Region | QS World University Rankings –Asia 022 | 301-350 | |
| | THE Emerging Economics Rankings 2022 | 301-350 | 18 |
| | THE Awards Asia 2021 : nominated Workplace of the Year | | |

2022 、 2021 University Rankings

| Category | Rankings | Ranked (World) | Ranked (Taiwan) |
|----------|---|----------------|-----------------|
| Subject | 2022 THE World University Rankings by Subject - Computer Science | 301-400 | 5 |
| | 2022 THE World University Rankings by Subject - Engineering | 601-800 | 7 |
| | 2022 THE World University Rankings by Subject - Physical Sciences | 1,001+ | 12 |
| | 2021 Round University Rankings - Subject Rankings – Technical Sciences | 557 | 15 |
| | 2021 Round University Rankings - Subject Rankings – Natural Sciences | 646 | 13 |
| | 2021 Round University Rankings - Subject Rankings – Life Sciences | 523 | 14 |
| | 2021 Round University Rankings - Subject Rankings – Humanities | 540 | 16 |
| | 2021 Round University Rankings - Subject Rankings – Medical Sciences | 460 | 8 |
| | 2021 Round University Rankings - Subject Rankings – Social Sciences | 538 | 17 |

Protective Measures of COVID-19 on NDHU Campus



Establishing the
epidemic prevention
team &
Holding university-level
epidemic prevention
conference



COVID-19 防疫專區
ANTIEPIDEMIC ZONE

防疫小組 防疫專區公告 各單位防疫資訊 通報調查 相關連結 大事記

COVID-19 防疫專區公告

防疫宣導 課程相關 宿舍相關 場館相關 校內餐廳 其他

2021-11-02 **【更新】** **【防疫公告】** 東華大學110/11/02防疫公告

2021-11-02 **【防疫公告】** 東華大學110/11/02防疫公告

2021-10-06 東華大學10/6防疫公告

2021-09-23 **【課務組公告】** 110-1學期因應防疫規定，經調整後之排課教室容量列表

2021-09-16 **【課務組公告】** 110-1學期選課相關公告 Announcement about 110-1 course selection

2021-09-13 同仁有發燒、呼吸道症狀、嗅味覺異常或腹瀉等，勿到辦公室上班，有症狀速就醫或篩檢

2021-09-10 東華大學防疫公告

防疫衛生教育影片

「如何預防糞口傳...」
可以阻絕排泄物中含有冠狀病毒的傳染可能

「居家隔離及居家...」
3.自己和家人都要勤洗手

Creating 'Anti-Epidemic Zone' on NDHU Webpage

Online Anti-Epidemic Group of Faculty and Staff Members



Following up with Individual Home Quarantine and On-Campus Fever Cases

Setting up Anti-Epidemic Dormitories Implementing Campus Epidemic Prevention Control

Implementing 'Stay Home, Stay Safe' Study Program

Monitoring Cafeteria
Epidemic Prevention
and Hygiene

Promoting the Keeping
of Social Distancing,
Frequent Hand Washing
and Mask Wearing



Incorporating Health Promotion into Epidemic Prevention and Creative LOGO Honored as Health Promoting School



健康促進融入防疫，東華大學榮獲健促標竿學校殊榮

最後更新日期：2020-07-27

SDG指標：SDGs03,SDGs04

教育部7月24日以「後防疫時期健促推動策略」辦理「109年大專校院健康促進學校推動人員線上研習」，藉由專題講座及防疫期間實戰經驗分享，供各校作為後防疫期間推動健康促進學校之業務規劃參考。此次研習國立東華大學健康促進推動成果成效斐然，為績優標竿學校，值得各校學習。

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防疫集點摸彩



負責全國大專校院健康促進計畫的臺灣師範大學教育學院郭鐘隆副院長，在「後防疫時期健促推動策略」演講專題，一開場就特別讚揚東華大學109年健康促進活動的規劃，別具巧思將健促活動融入防疫中，遠距入班宣導、創立防疫社團及推動人人都是防疫守護者的創意宣導，讓防疫硬梆梆的知識活潑化，每天都能落實防疫，在防疫期間健促沒有打烊，是健康促進與防疫社會廣自示範學校，此舉值得各校學習。

賀！東華大學防疫貼紙集點卡獲國立臺灣歷史博物館納入館藏

最後更新日期：2020-12-03

SDG指標：SDGs11,SDGs03



立東華大學為因應嚴重特殊傳染性肺炎疫情，配合中央

疫情指揮中心一級開設，於3月17日起提升為一級防疫等級，自當日起對進入校園人員全面量測體溫，副校長徐輝明教授身先士卒於大學門口輪值，為蒞校訪客車輛之駕駛、乘客量測體溫，經量測體溫異常者（額溫 ≥ 37.5 度），須至管制站旁之觀察區靜坐休息5至10分鐘後複測，複測體溫正常者給予體溫合格貼紙後始得進入校園。



東華大學總務處為提升師生同仁之認同感與參與感，並兼顧防疫辨識效果，特別以校園地景、學院建築及多件文化部公共藝術獎得獎作品的照片印製校園防疫貼紙，並與學務處合作推行校園防疫集點卡活動，以擴大防疫宣導，鼓勵師生同仁落實自主健康管理，提升校園防疫成效，本活動相關防疫物件並已獲得國立臺灣歷史博物館納入其當代蒐藏計畫之館藏。

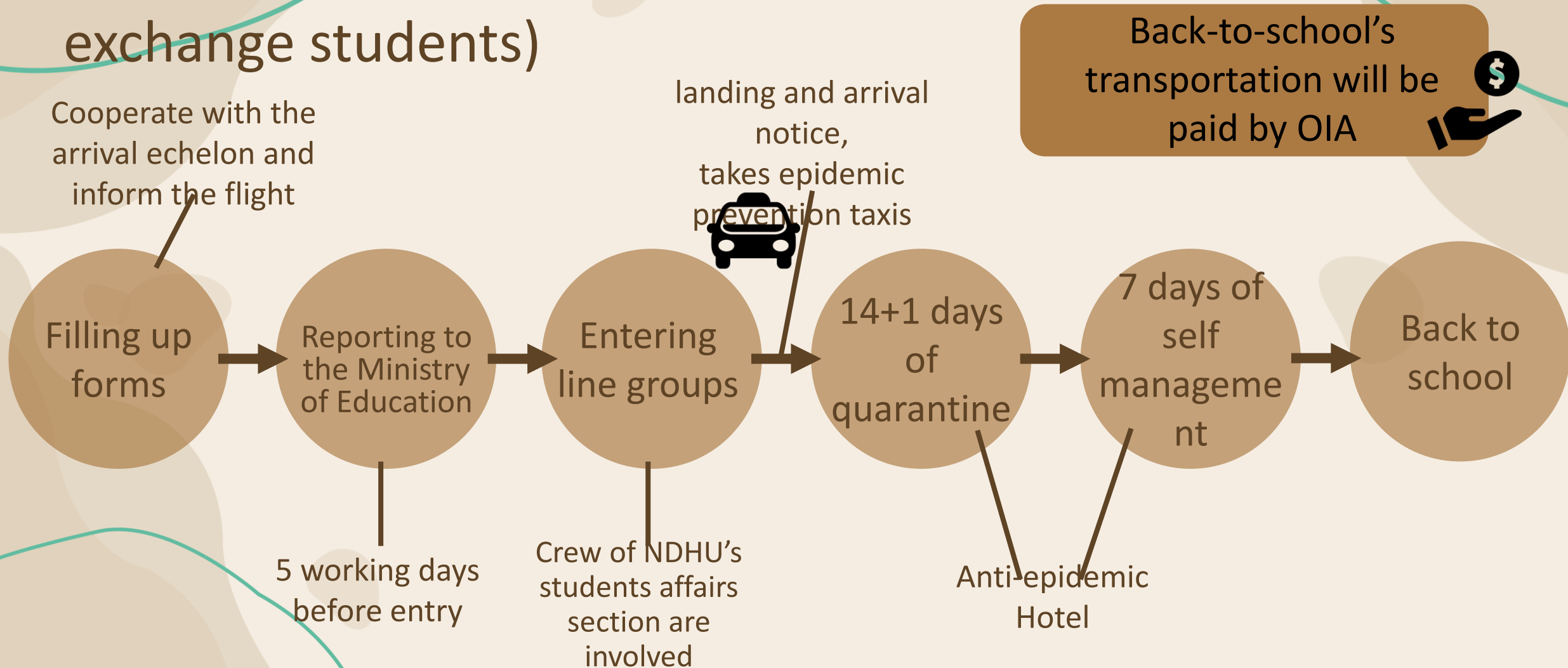
國立臺灣歷史博物館發起「COVID-19（嚴重特殊傳染性肺炎）」物件蒐集計畫，試圖保存全民抗疫、防疫的行動紀錄，希望蒐集成果能讓以後的人們看見

Foreign student's welfare during the epidemic



Entry guidance &
Subsidy plan

Entry and enrolments of new students abroad (including exchange students)





Daily class
situations
(Level 1 、 Level 2)

Flexible working (Level 1、Level 2)



Discussion of a
better examination
price with
Mennonite
Christian Hospital.



Changes in teaching methods during pandemic

- Teaching strategy adjustments followed by Central Epidemic Command Center (CECC)
- On 2021/5/17, all courses went online in NDHU
 - How to transition teachers' teaching methods from a physical classroom to online?
 - Advanced preparation: NDHU planning and arrangement
 - How to ensure learning effectiveness in an online classroom?
 - Oral examination adjustments for MA and PhD students

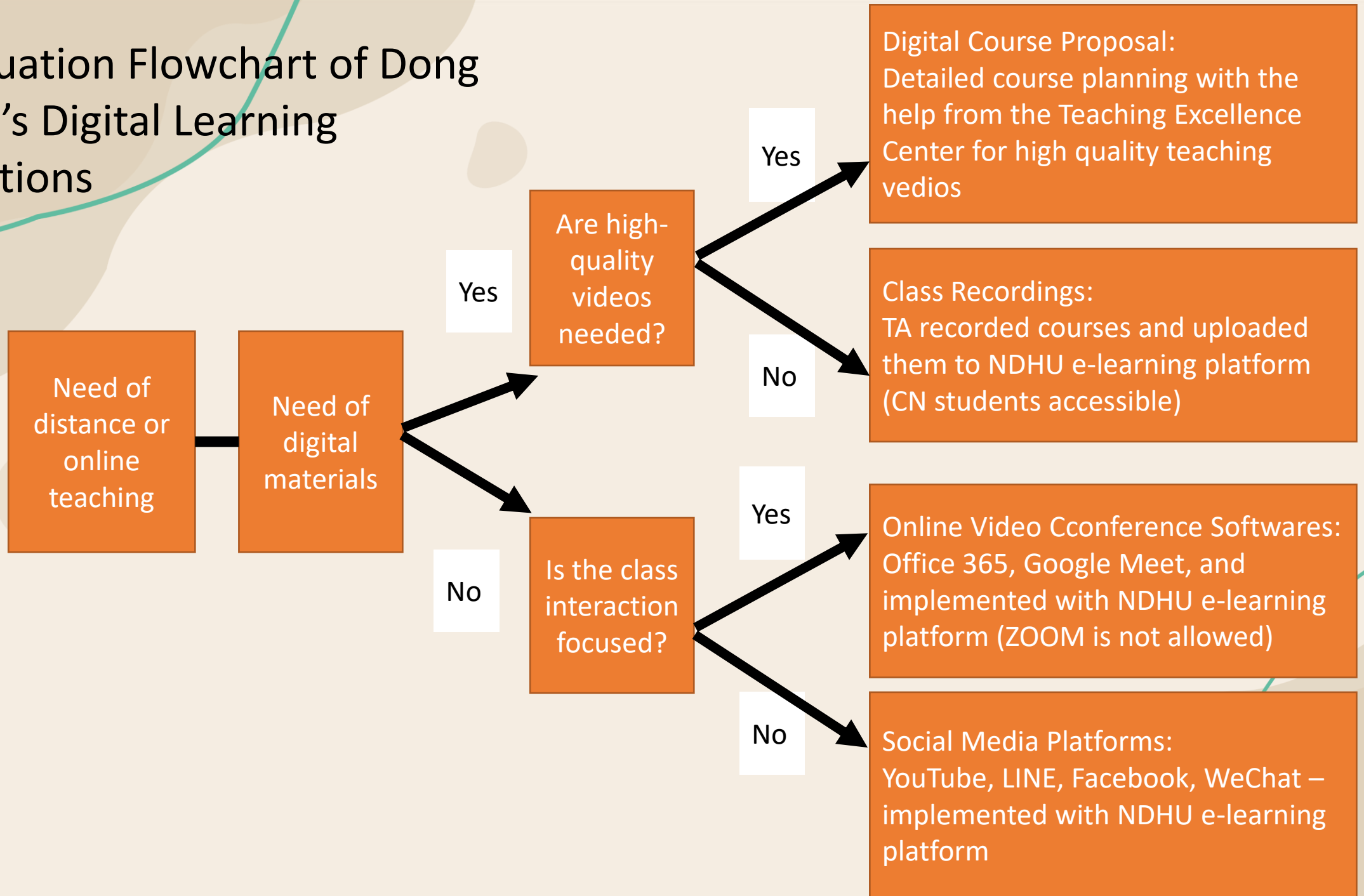
Teacher guide to online Learning during the pandemic

- Online course dilemmas
 - Various technology for online teaching is available in the IT market, but Taiwan's market had little interest
 - Due to the epidemic, online and live streaming teaching have garnered attention
- Not all courses are suitable for online or live streaming instruction

Teacher guide to online Learning during the pandemic

- Online courses need multiple assessment and evaluation methods
 - Weekly assignments or online quizzes
 - Online report or oral exam
 - Video reports
- Teachers in our school were helped in adapting evaluation mechanisms

Evaluation Flowchart of Dong Hwa's Digital Learning Solutions



Dong Hwa's Advanced Preparation



Recommended!

- Synchronous online teaching plan
 - General
 - Use online meetings to conduct courses
 - Advanced
 - Use online meeting software and recorded course videos online
- Asynchronous teaching plan
 - Easy-Material upload
 - Upload textbook readings and slides in PDF with explanations to NDHU e-learning platform
 - General-Class recording
 - Use recording equipment (i.e. cellphone) to record courses.
 - Advanced-Screen recording
 - Screen record the slide presentation and upload to NDHU e-learning platform

Online teaching guide during pandemic

- Teacher's evaluation and best online teaching choice
 - Synchronous online teaching
 - (Basic Model) live streaming
 - Use Google Meet or Office Teams
 - Can be recorded for students to review after class
 - (Advanced) Interactive live streaming
 - Use Google Meet or Office Teams discussion forums
 - Use Zuvio for interaction
 - (High-level) Online Group Discussion
 - Use Google Meet or Office Teams group discussion functions
 - The benefits of online discussion and recording functions may be better than those in the physical classroom

Online teaching guide during pandemic

- Teacher's evaluation and best online teaching choice
 - Asynchronous online teaching
 - Why?
 - Unstable network in quarantine or isolation
 - Home environments with unstable internet, insufficient equipment
 - Pre-recorded teaching videos or e-books
 - Turn good quality videos into MOOCS
 - Facilitate online flipped-teaching, and flexible teaching
 - More interaction between teachers and students

Online teaching guide during pandemic

- Impact
 - Instructors find online teaching is not difficult or scary
 - Students have videos to review after class
 - Modifications in lecture styles
 - Inviting speakers becomes more diverse and convenient
 - New demands
 - How are on and offline courses combined?
 - Hybrid teaching: on and offline teaching
 - Live stream the in-class teaching process

Student achievement evaluations during the pandemic

- Student performance reviews for all online courses
 - Weekly online quizzes, homework or reports
 - Students can scan and upload homework or reports
 - Upload video productions or performances
 - Final online tests or seminar reports
 - Cameras on during the test and upload the test paper
 - Upload video productions or performances
 - Online oral examinations for MA and PhD students
- Online test schemes are not for all courses
 - Special equipment or location need
 - Factory, swimming, etc.

Teachers' response to epidemic teaching methods

- Accept more online teaching or instructional videos
- Online course experiences make the teaching method more flexible
- Multiple-evaluation mechanisms for online courses has activated new methods of physical-teaching evaluation
- Increased demand for hybrid classrooms (physical classrooms and online teaching in parallel)
 - How to achieve it in a regular classroom?

Dilemmas and challenges

- How to carry out hybrid classrooms in regular classrooms
 - Purpose: Reduce the teaching loads and maintain the quality of the recorded video
- How to adapt to the epidemic situation when online course instruction is unavailable?
- Challenges of online tests
 - Surrogate (stand-in or ghost-writer)
 - Is there only one person under examination at the time of the test?
 - How to confirm the examinee's (student's) identity?

SWOT Analysis Covid-19 pandemic has taken a heavy toll on the education

Strengths

- Most higher education institutions have managed the transition
- Students have high acceptance of the operation of the network application platform
- 5G network
- Faculty have adapted to teaching online and hybrid courses

Opportunities

- Focus on teaching and learning in a way that many institutions haven't done in the past
- More inclusive and creative pedagogical solutions
- The traditional learning can evolve into a mixed learning model to enhance learning efficiency
- Upgrade to a metaverse learning model to achieve the ideal of fieldless learning

Threats

- Some courses and exams still need to be taught face-to-face
- Rejection of learning online learning platforms
- Be accustomed to face-to-face teaching
- Production and quality of digital teaching materials



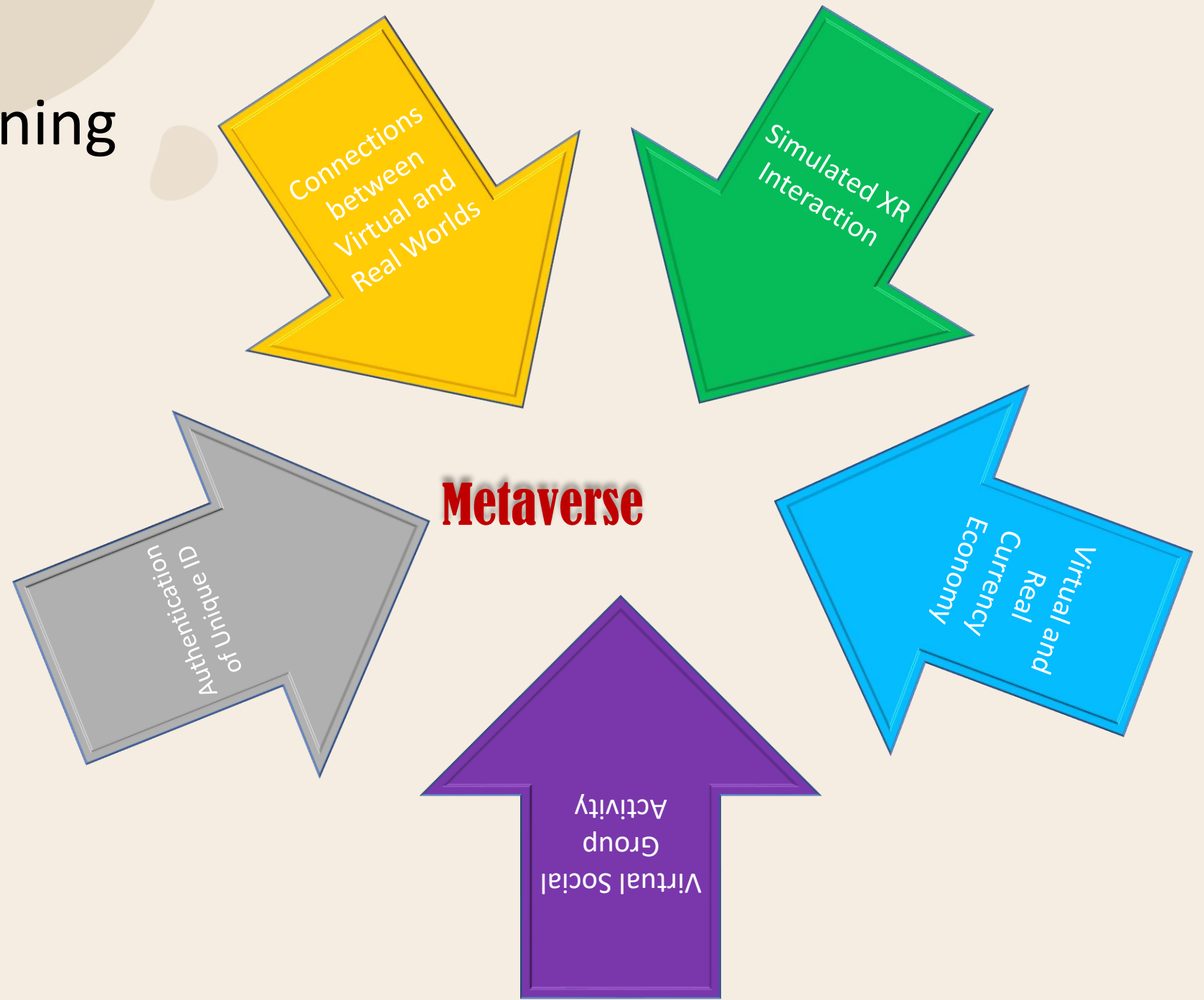
Weakness

- Most faculty had no remote teaching experience
- Higher education institutions lacks excellent distance teaching equipment and platforms
- Not every student has internet resources
- Internet bandwidth limitation

Mixed Learning

- Advantages for future courses which are offered through mixtures of online and offline classes:
 - In the event of a pandemic, courses can be switched immediately to online classes.
 - Online platform comes with functions of social group discussion, real-time recording and play back which are capable of supporting insufficiencies from physical class functions.
 - Students generally have a high degree of acceptance on online teaching.
 - Face-to-face teaching is capable of making up deficiencies from on-line examination.
- Deficiencies for future courses which are offered through mixtures of online and offline classes:
 - It is difficult to identify online student's ID.
 - It is difficult to manage online students' actual learning condition.
 - Online class learning will be affected in the event of poorly-made teaching materials.
 - Students are prone to have difficulty in adapting to switch between face-to-face and online teaching.

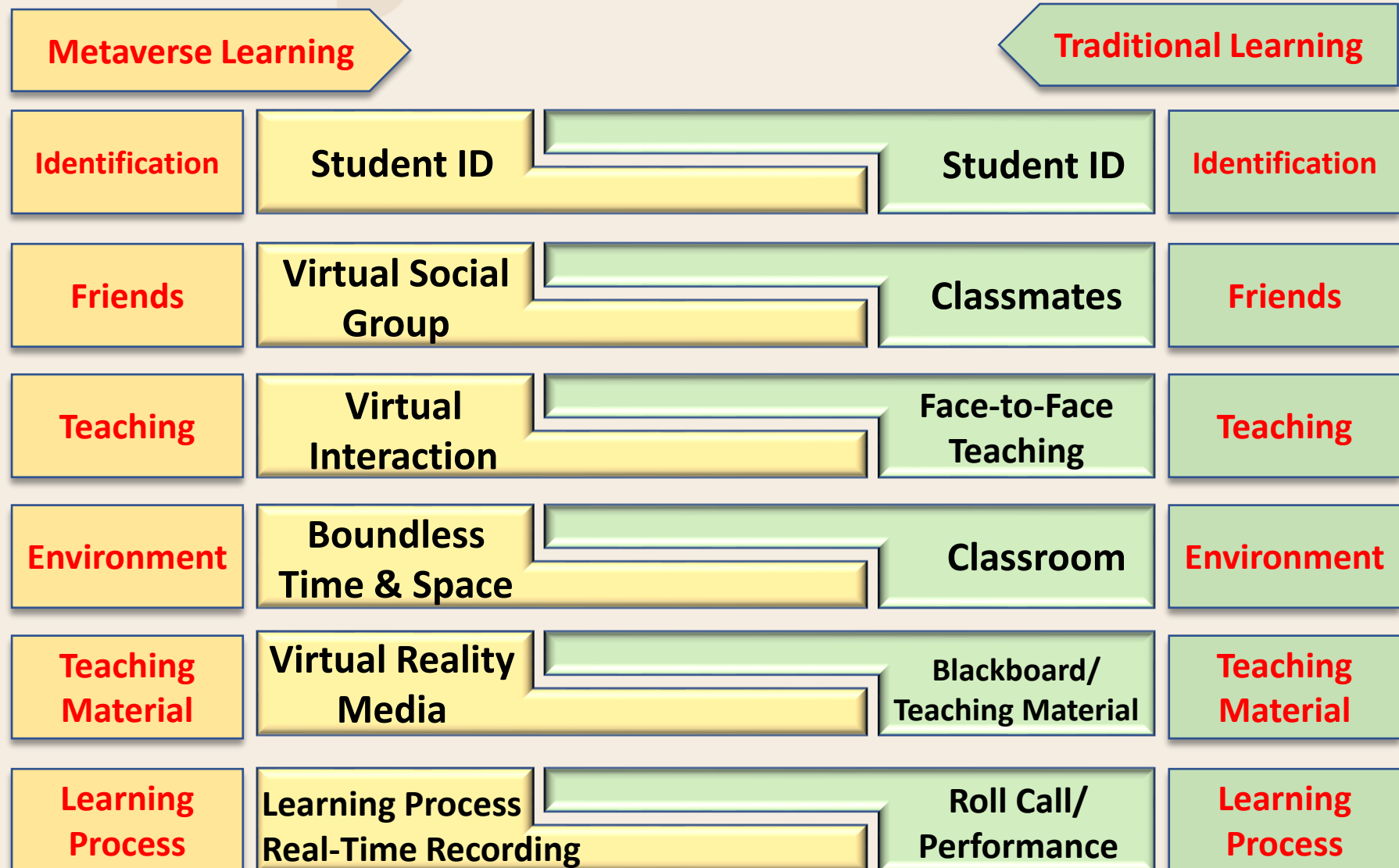
Metaverse Learning



Metaverse Learning

- Metaverse learning comes with all advantages from face-to-face teaching and online learning, and is capable of making up their deficiencies.
 - It is a connection between real world and virtual world. Switch can be conducted anytime when responding to learning environment under pandemic.
 - Learning process is automatically recorded completely. Respective learning certificates, awards, graduation certificates and so on can be stored in Metaverse forever.
 - There are no limits of space or time with regard to learning which can be conducted anytime and anywhere.
 - Virtual environment and simulated interaction between teachers and students can make up online learning deficiencies of lack of interaction between teachers and students.
 - Virtual 3D multi-media teaching materials can supplement real-scenario interactive teaching which cannot be achieved by real environment.
 - Immersive interactive virtual learning has high learning efficiency.
 - There are no restrictions from physical equipment and environment. It is easy to conduct various apprenticeships and practices in Metaverse in order to enhance students' employment experience.

Metaverse Learning



Metaverse Learning

- Six Main Techniques

- Blockchain
 - ID Certification, Digital Certificate, Learning Process, Learning Performance
- Network
 - Ultra-Speed Stable Network, Cloud Service, Cloud Computing
- Artificial Intelligence
 - Gesture Detection, Virtual Intelligence, Natural Language Processing
- Internet of Things
 - Physical Sensibility Connecting Real and Virtual Worlds
- Interactivity
 - XR Interactive System 、 Social Interactive
- Multimedia
 - High-Speed Simulated 3D VR Environment, 3D Media Teaching Material

Metaverse Learning in National Dong Hwa University



Metaverse Learning in National Dong Hwa University

| Names of Events | Introduction of Events |
|---|---|
| Han Tze Campus Corporate Virtual Company | Through the operation of a virtual corporation, students are allowed to assume various posts of a company. Students are able to have an early experience of operation patterns in work place through actual operation of practices. |
| Student Virtual Reality Competition | A Dong Hwa campus navigation model was established by students. |
| Utilization of Block Chain Technology to Store Student's Certificates Forever | Current operation pattern of student ID is combined with block chain technology allows students to have e-graduation certificates. |

Metaverse Learning in National Dong Hwa University

Preeminent Performance by “AR/VR Technology Promoting Eastern Taiwan Digital Economy” Research Team from Department of Computer Science and Information Technology of National Dong Hwa University

With focus on tourism and agricultural digital economy in Hualien and Taitung, Department of Computer Science and Information Engineering of National Dong Hwa University integrates advanced Virtual Reality (VR), Augmented Reality (AR) and related technologies of computer vision, and breaks through current unfavorable restrictions on Hualien and Taitung to develop virtual tourism interaction contents. It has also developed agricultural remote monitoring and management system, which is capable of automatic monitoring and telepresence, as well as smart safe drive navigation service which comes with augmented navigation function. These have injected new green digital power into local tourism and agricultural industries.



Metaverse Learning in National Dong Hwa University

Alliance with HTC in Establishing the First VR Talent Incubation Center in Eastern Taiwan

Department of Computer Science and Information Engineering of Dong Hwa University entered an Academia-Industry Collaboration Memorandum of Understanding with HTC Corporation on November 19th, 2020 to build up the first VR (Virtual Reality) talent incubation center in eastern Taiwan. Going forward, the parties will collaborate in establishing HTC VIVE teaching certification center to enhance VR research and development capability.





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**Thank you for your attention.
Your questions & comments are always welcome.**