

**Primary and Secondary Education in the COVID 19 era: how
teachers can maximize the use of instructional technologies**

Authors

Frank Owarish, Ph.D., Computer Science; Anup Sharma, MS Instructional Technologies

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Introduction

This paper looks at how to provide education in the COVID-19 era; it is clear that a new hybrid approach is needed that consists of collaborative in-class and online teaching. In this context, the use of instructional technologies is warranted, and this paper provides teacher training needed in context. There should be appropriate orientation for the students as well as for parents. Tech support to teachers is crucial...

Primary and Secondary Education

The target population is students from first to twelve grades. Traditionally, education at these levels have been mostly in class and, to some extent, online. At the higher level, often the curriculum aims at prepping students for college.

Higher education is education provided by universities, colleges, and other institutions that award academic degrees. Higher education includes both the undergraduate (i.e., college) and the graduate (or postgraduate) levels. Higher education includes most professional education and is strongly professionally oriented. Higher education differs from other post-secondary (after high school) education, such as vocational education. Vocational education is a form of secondary or post-secondary education but is considered non-academic compared to higher education.

Kids are facing challenges as the new school year begins:

Pearson (2020). 6 Ways to help your kid cope with back-to-school disappointment. Full https://www.huffpost.com/entry/help-kid-cope-back-to-school_l_5f329ca9c5b64cc99fde5586

New York City School Reopening Plan

<https://nypost.com/2020/09/01/nyc-to-delay-reopening-of-schools-mayor-de-blasio-announces/>

The following technologies revolutionized education

Accessibility to computers, the Internet and World Wide Web including powerful search tools online, databases, smartphones, online learning platforms

Google vast array of educational tools

Microsoft Office, particularly Word, PowerPoint and Excel

The Internet of Things IoT

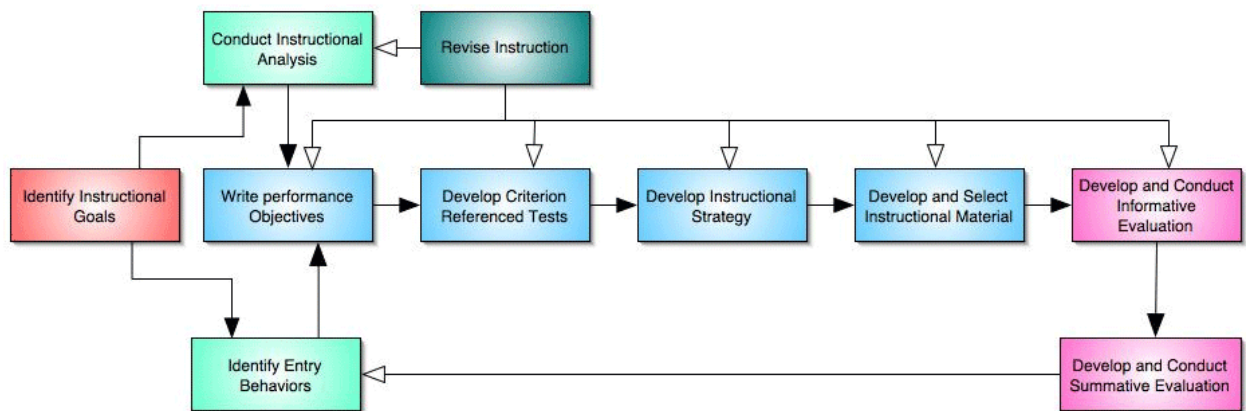
Instructional Design

System of procedure for developing education and training programs consistently and reliably (Gustafson & Branch, 2002, p. 17)

Instructional systems design techniques became common after the 1970s first in the military, and then in other industrial and commercial training applications. It is the systemic process of analyzing learning needs and goals and developing instructional materials and activities to ensure instruction quality. It is the framework for developing effective instruction for learners.

Two Well Known Models

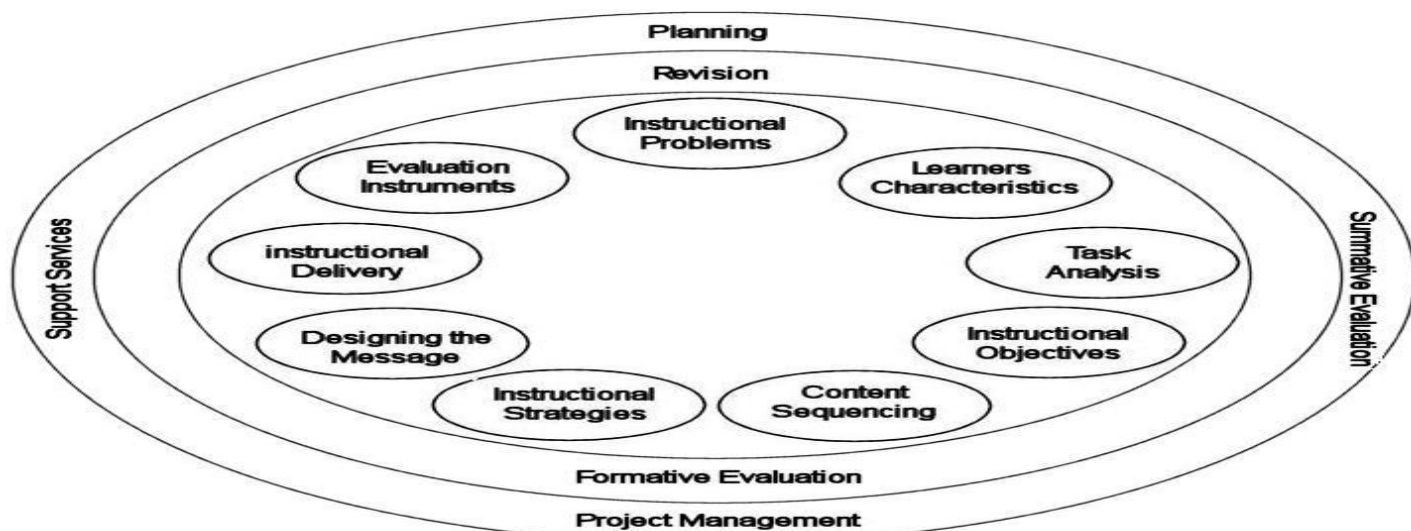
Dick and Carey Model (DC) ADDIE Model - consists of 10 components, emphasis on the instructional design process (can be used for course or curriculum). Also known as the System Approach Model, this model helps identify what to teach and how to teach it. All ten steps in the Dick and Carey Model are interconnected and influence each other directly or indirectly.



Dick and Carey Instructional Design Model

Dick, Cary, L., & Carey J (1978). The Dick and Carey Model – 1978. Retrieved from: https://www.google.com/search?q=dick+and+carrie+models&source=lnms&tbn=isch&sa=X&ved=2ahUKEwi1wtGSmlXrAhXtY98KHcnTBd8Q_AUoAXoECAwQAw&biw=1536&bih=763#imgsrc=OqZeCkU_3H787M

Morrison, Ross, and Kemp Model (MRK), - consist of 9 interrelated steps, a linear approach that is interdependent (usually for 1-2 hours of instruction). It follows a circular structure rather than a linear structure. It provides more flexibility as any of the nine components can be used to begin the design process.



Instructional Strategies

Gagne's Events of Instruction (Gaining attention, Informing the learner of the objectives, assessing, motivate, evaluate) Gagne's instruction events address learning conditions and provide a foundation upon which online courses can be structured.



Bloom's Taxonomy

Bloom's taxonomy is a set of three hierarchical models used to classify educational learning objectives into complexity and specificity levels. The three lists cover the learning objectives in cognitive, affective, and sensory domains. The cognitive domain list has been the primary focus of most traditional education and is frequently used to structure curriculum learning objectives, assessments, and activities. The cognitive domain, which is frequently used, consists of six main categories. Based on the revised edition of 2001, it consists of categories (remember, understand, apply, analyze, evaluate, create) that can be used to structure the learning objectives, lessons, and course assessment



Source: Armstrong, P. (2016). Bloom's taxonomy. Vanderbilt University Center for Teaching; Sosniak, L. A. (1994). Bloom's taxonomy. L. W. Anderson (Ed.). Chicago, IL: Univ. Chicago Press.

Training Today

Today we want information faster and cheaper (create once, use much time, reduce time-to-market, reduce cost, better allocation of resources, more for less)

Support learning 24 hours a day; support no longer needs to be a live person, but even self-study portal or community forums are an effective way of providing support.

Increase engagement, motivation, use of technology to engage learners of all ages.

Accelerate learning

Personalize learning; learners can access learning related to their role and requirement.

Technology Available

Collaboration, Feedback, Videos, Social Learning

Technology infuses classroom with digital learning tools

Different types used in school - Online learning, Full-time Online School, Blended

Learning Approach, Open Resource

Growth in Open Source Technology

SaaS based subscription for LMS, LCMS & CMS

Technology moving to cloud

Challenges

Engage Learners (Meaningful engagement)

- o Retain information and can use in a job is a meaningful engagement

Signs and symptoms of learner engagement

- o Ask a purposeful question; challenges ideas collaborate with the team, think strategically

Encourage problem-solving activity, create problem-solving activity, decision making,

investigation (examining and analyzing), reflective thinking Create Training Vs Design Training

Create Training

- Required elements, delivery formats, defined structures, development tools
- Design Training
- Instruction design, student insight, writer inference, intuition, aptitude, experience

Change Management

Change can bring fear but may be seen as an opportunity

Return on Investment is needed

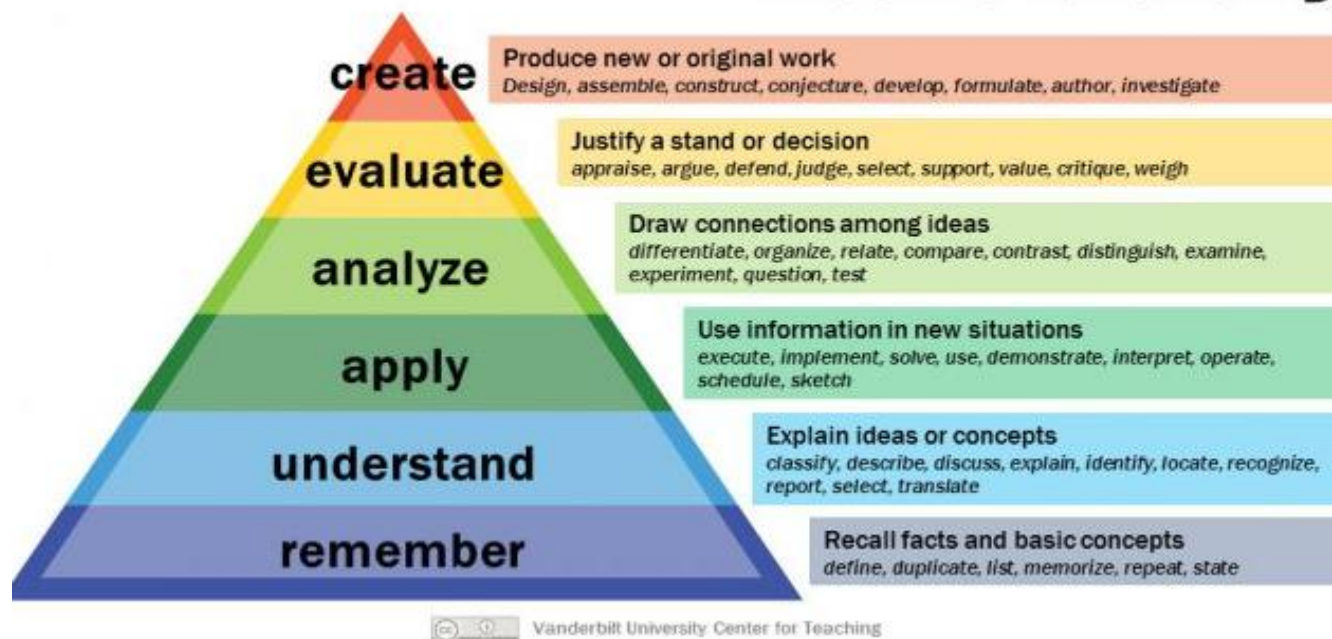
Strategy first (plan infrastructure, defined rules of engagement, select tools and resource, implement the architecture)

Tactics last (convert legacy content, create new content, expand, increase customization)

Fundamentals of learning

Learning is not just cognitive (knowledge) in nature but also conative (skills) and affective (behavioral). More on Bloom's Taxonomy:

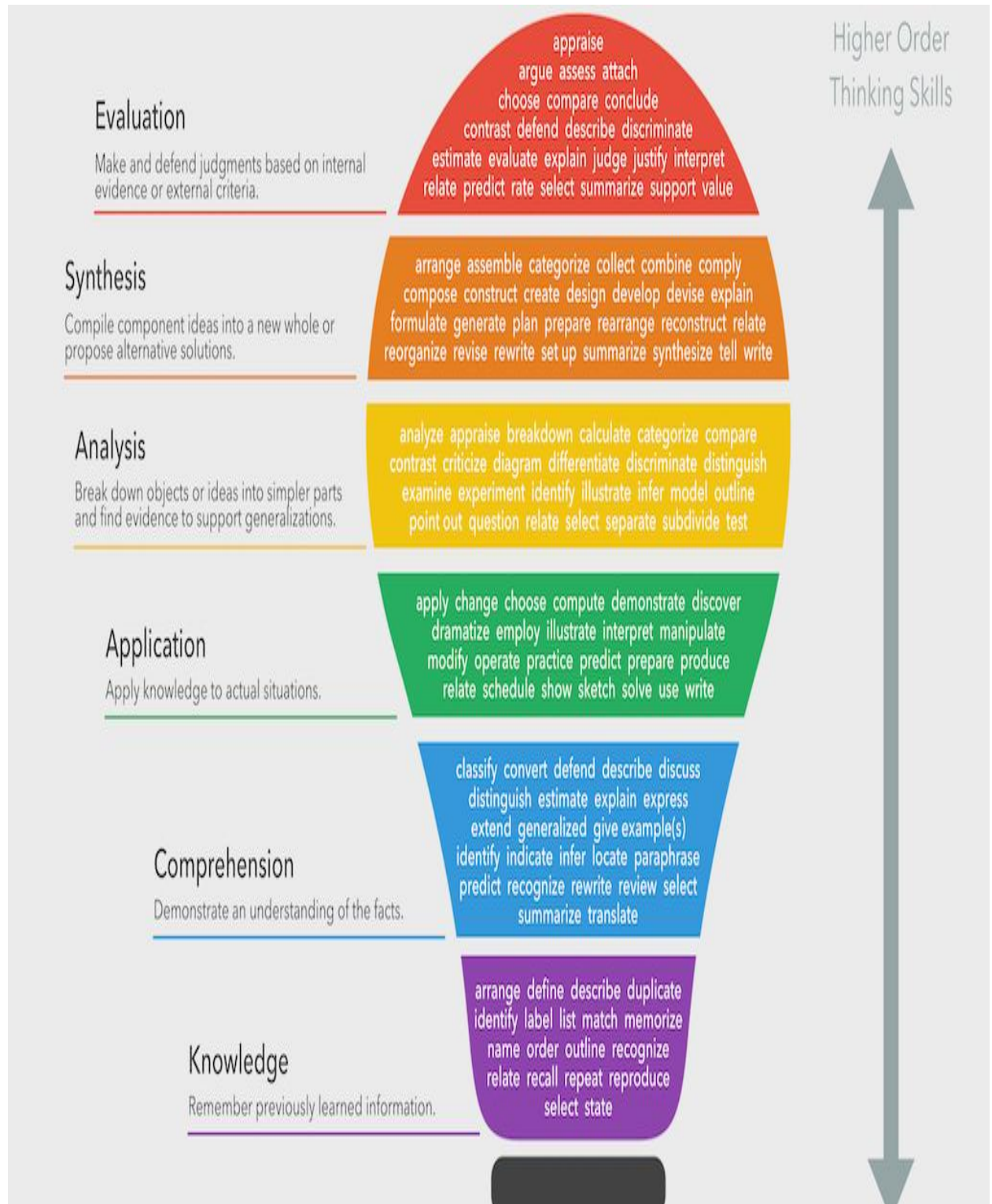
Bloom's Taxonomy



Source: Armstrong, P. (2016). Bloom's taxonomy. Vanderbilt University Center for Teaching.

https://www.google.com/search?q=bloom's+taxonomy&tbn=isch&source=iu&ictx=1&firs=LY1ImA3IdOodNM%253A%252CihYVGKoLF9Aj1M%252C%252Fm%252F01mr53&usg=AI4_-kSALSZNMKhFkOvX6BpXcQKOQa2AhA&sa=X&ved=2ahUKEwiq17fY2OPgAhXndd8KHZmDCYoQ_B0wMnoECAQQBg#imgsrc=LY1ImA3IdOodNM

Elaboration on Bloom's taxonomy



Source: Fractus Learning (2020) Blooms Taxonomy verbs. Retrieved from <https://www.fractuslearning.com/blooms-taxonomy-verbs-free-chart/>

BLOOM'S TAXONOMY DIGITAL PLANNING VERBS					
REMEMBERING	UNDERSTANDING	APPLYING	ANALYZING	EVALUATING	CREATING
					
Copying	Annotating	Acting out	Calculating	Arguing	Blogging
Defining	Tweeting	Articulate	Categorizing	Validating	Building
Finding	Associating	Reenact	Breaking Down	Testing	Animating
Locating	Tagging	Loading	Correlating	Scoring	Adapting
Quoting	Summarizing	Choosing	Deconstructing	Assessing	Collaborating
Listening	Relating	Determining	Linking	Criticizing	Composing
Googling	Categorizing	Displaying	Mashing	Commenting	Directing
Repeating	Paraphrasing	Judging	Mind-Mapping	Debating	Devising
Retrieving	Predicting	Executing	Organizing	Defending	Podcasting
Outlining	Comparing	Examining	Appraising	Detecting	Wiki Building
Highlighting	Contrasting	Implementing	Advertising	Experimenting	Writing
Memorizing	Commenting	Sketching	Dividing	Grading	Filming
Networking	Journaling	Experimenting	Deducing	Hypothesizing	Programming
Searching	Interpreting	Hacking	Distinguishing	Measuring	Simulating
Identifying	Grouping	Interviewing	Illustrating	Moderating	Role Playing
Selecting	Inferring	Painting	Questioning	Posting	Solving
Tabulating	Estimating	Preparing	Structuring	Predicting	Mixing
Duplicating	Extending	Playing	Integrating	Rating	Facilitating
Matching	Gathering	Integrating	Attributing	Reflecting	Managing
Bookmarking	Exemplifying	Presenting	Estimating	Reviewing	Negotiating
Bullet-pointing	Expressing	Charting	Explaining	Editorializing	Leading

Source: Teachthought (2020, May 1). What is Bloom's Taxonomy? A Definition for Teachers. Retrieved from <https://www.teachthought.com/learning/what-is-blooms-taxonomy-a-definition-for-teachers/>

Bottom line

Instructional methodologies have to foster these different learning types, and so, to state the apparent lecturing is not enough.

In class methods

In addition to lecture (traditional and through use of projector), case studies, brainstorming, discussion, role-playing, simulation exercise, debate, presentation by the student, and a team of students (teamwork); computer labs; and library searches including databases. Write up of personal views; critique

Online methods

Study, analysis, search and further analysis, discussion; teamwork; write up of personal views; critique

Instructional technologies: aim

To foster discovery learning, where to find relevant info and knowledge, how to analyze (use of big data tools)

Libraries

Play an important part in education

Have evolved over time mostly as a result of development of IT (Information Technologies)

Library traditional

Typical has printed material

Books

Journals

Magazines

Newspapers

Library modern

In addition to printed material the typical library has PCs with online access to the Internet (vast array of educational resources), online databases e.g. EBSCO, online analytical tools such as SPSS, SAS, online platforms such as Blackboard

Online databases

https://www.google.com/search?source=hp&ei=oACNXLGtOoXn_QaJnaOgAQ&q=online+databases+for+research&oq=online+databases&gs_l=psy-ab.1.1.0l10.1073.5154..12080...0.0..0.196.1185.16j1.....0....1..gws-wiz.....0..35i39j0i131.8iK3y8X0Vi8

Software

Proprietary

Open source

https://www.google.com/search?ei=rQCNXNaSJ8-MggeFtJfoCA&q=free+online+platforms+for+education&oq=free+online+platform&gs_l=psy-ab.1.3.0l8.319959.354582..359570...1.0..0.113.3297.46j2.....0....1..gws-wiz.....6..0i71j35i39j0i22i30j0i20i263j0i131j0i67j0i131i67.FvV6KTV8cYU

Useful tool

<https://edu.google.com/openonline/>

Virtual reality

VR has a major impact on education at all levels

State of the art: NYU virtual business library

<https://guides.nyu.edu/vbl>

Multimedia

Aim is to avoid the monotony of straight text and voice; a picture is worth more than a thousand words

They can be used both in-class and online:

eBooks

Videos

Video books

Movies

Games (powerful learning tool)

Optimal approach for the COVID 19 era

First we have to be more precise of our targets and target our approach as appropriate considering attention span::

-Pre-primary

-Primary-Grade 5

-Middle School Grade 8-8

-High School Grade 9-12

The following may be considered as elements of an appropriate approach:

-short videos

-movies

-games

-interactive exercises

-step by step searches

-use of electronic libraries

-students write their comments in particular expressing their views

-Q&A after each segment

The 10 Best Free Video Conferencing Tools to Choose From

1. Zoom
2. Google Hangouts
3. UberConference
4. TrueConf Online
5. Skype
6. FreeConference
7. Appear.in
8. Slack Video Calls
9. Facebook Live
10. YouTube Live

In conclusion

Education is as 'exciting' as it has ever been; it will continue to evolve more with technological developments.

More on educational technology:

Educational technology e-tech books

https://www.google.com/search?sa=X&q=educational+technology+edtech+books&stick=H4sIAAAAAAONgFuLUz9U3MDOPT7NQQjC1RLKTrfST83Nz8_OsUvLL88oTi1KKVzEKAsVyclKTSzLz8_ST8vOzixexKqemlCYngkQScxRKUpMz8vJz8tMrFVJTQBwFsCoA0BJebWgAAA&ved=2ahUKEwjZyKbl6ePgAhWknuAKHQYlA8YQMSgAMBl6BAGAEAE&biw=1600&bih=782

Annex 1: Dealing with an unprecedented situation; conducting learning in-class or online or hybrid

- a) Hard numbers and school re opening

<https://www.msn.com/en-us/news/technology/commentary-hard-numbers-should-dictate-school-reopenings/ar-BB186Her?ocid=msedgdhp>

- b) Case study: New York City Archdiocese deciding to go the traditional way

<https://www.msn.com/en-us/news/us/nyc-catholic-schools-set-to-return-to-fully-in-person-classes-5-days-a-week/ar-BB188xQj?ocid=msedgdhp>

- c) Detailed plans of the schools in Summit, NJ

https://www.summit.k12.nj.us/uploaded/DISTRICT_FILES/Parent_Handbook.pdf

https://www.summit.k12.nj.us/uploaded/SHS_FILES/SHS_Opening_Handbook_Website.pdf

- d) Round the world perspective

As students and teachers around the world return to class

<https://www.msn.com/en-us/news/us/lessons-for-u-s-schools-as-students-and-teachers-around-the-world-return-to-class/vi-BB18AKD9?ocid=msedgdhp>

Class time again across Europe

<https://www.msn.com/en-us/news/world/it-s-class-time-again-across-europe-virus-or-no/ar-BB18Ax9?ocid=msedgdhp>

- e) Education – the new normal

[https://www.oliverwyman.com/content/dam/oliver-](https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2020/jun/Education_In_The_New_Normal.pdf)

[wyman/v2/publications/2020/jun/Education_In_The_New_Normal.pdf](https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2020/jun/Education_In_The_New_Normal.pdf)

Annex 2: Resources

There is a vast amount of resources available online; the following sources are illustrative

Making videos

https://padcaster.com/?utm_source=Bing&utm_medium=Text-Ad&utm_campaign=Brand&utm_term=Home-Page&mclid=b9d330977d8612eb19116faa25af2cfb

Making use of smart TVs

<https://www.cnet.com/news/google-meet-comes-to-chromecast/>

The video chat app is arriving on smart TVs this week, Google said.

Learning video collections for kids

<https://www.youtube.com/watch?v=97wFth-uHVY>

18 educational youtube channels for kids

<https://www.chicagoparent.com/play/educational-youtube-channels-for-kids/>

Educational games

https://www.google.com/search?rlz=1C1APWK_enUS915US915&ei=T51LX47wGY-I_QaW0bOoCg&q=educational+games&oq=educational+games&gs_lcp=CgZwc3ktYWIQDDIFCAAQsQMMyAggAMgIIADICCAAYAggAMgIIADICCAAYAggAMgIIADICCAA6BAGAEec6BAGAEEM6CAguEMcBEK8BOggIABCxAXCDAToICC4QxwEQowI6BQgAEJECoggIABCxAXCRAIDRb1jrwQFghuwCaABWAngAgAGDAYgBmhCSAQzQzMC4xmAEAoAEBggEHZ3dzLXdpesABAQ&scient=psy-ab&ved=0ahUKEwjO0_Tl_MLrAhWPUt8KHZboDKUQ4dUDCA0

10 Simple ways to make writing fun

<https://medium.com/the-mission/10-simple-ways-to-make-writing-fun-1b53b426ac07>

Blue School vast array of resources

https://www.google.com/search?rlz=1C1APWK_enUS915US915&ei=up9LX-2pHcK5ggfkjaS4BA&q=blue+school+online&oq=blue+school+online&gs_lcp=CgZwc3ktYWIQDDoECAAQRzoECAAQQzoCCAA6BggAEByQHjoCCC46BQgAELEDOggILhDHARCvAToICAAQsQMqgwE6CAguEMcBEKMCOgclABCxAXAKOgslLhCxAXDHARCjAjoECC4QQzoKCC4QxwEQowIQzoKCAAQsQMqgwEQQzoICC4QsQMqgwE6BQguELEDOgUIABCRAjoOCAAQ6gIQtAIQmgEQ5QI6CwgAELEDEIMBEJECogclLhCxAXBDog4ILhCxAXDHARCjAhCTAjoOCC4QsQMqgwEQxwEQowI6BAGAEAo6CwguEMcBEK8BEJMCUNetAli5vQNgw9sDaAFwAngAgAGNAYgB2hGSAQQzMi4xmAEAoAEBggEHZ3dzLXdperABBsABAQ&scient=psy-ab&ved=0ahUKEwjT7ozw-sLrAhXCnOAKHeQGCUCQ4dUDCA0