Screen Ontologies or Teaching the Virus a Lesson: A Few Things that Work in Online Education and a Few that Don't

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Abstract

The recent global disruption in education due to the COVID-19 virus has led to a significant increase, if not an explosion, in education studies. Research into and application of digital pedagogical strategies in general and (vision-based) online teaching in particular have reached new heights. Many studies focus on the strengths of this new online education and, indeed, much of the data points to its success. However, other studies elicit slightly less positive data. The study at hand will take both of these scientific strands seriously and try to interpret them. This will be achieved in the first place through the analysis of a number of significant studies on online teaching and commenting on their methodologies and basic premises. Secondly, this will be achieved through a rendition of the author's own teaching experience under COVID-19 conditions. Then one of the sine-qua-nons of online education will be examined, namely the screen, a central device left unaddressed by most other research. Using an ontological interpretative approach, the study will demonstrate why at least some of the promises of online education simply cannot be kept. Lastly, the study will list ways in which a thoroughly reflected approach to online education can nevertheless play an important role in preparing students for a post-screen and post-postdigital world.

Keywords: distance education, media philosophy, online education, screen studies

Especially in times of COVID-19, uncertainties persist and continue to characterize the human condition. In particular, this virus has brought massive challenges to K-12 and Higher Education practices, including decreased mobility, deepened polarizations and less inclusion and diversity (Mok 2020; Aristovnik 2020; Jelińska, 2021). As of April 2020, more than 1.5 billion students in 195 countries were affected by COVID-19 prompted school closures (UNESCO 2020). In 2021, this figure has decreased somewhat, but there is still much fallout from continued kindergarten, school and university closures.

When it comes to distance education, over the last year and a half many educators and their students have had to navigate a steep learning curve. No matter where one looks on the globe, at least partial distance/online learning was used in most teaching endeavours, be they located in primary, secondary or tertiary pedagogical institutions. Much research has been conducted to analyse and, ideally, improve online teaching practices. This text will claim that the current situation is nevertheless unsatisfactory, as most of online-education research and literature solely focuses on usability issues without taking into account certain philosophical factors playing an important role in the design and access processes to online media for education. Case in point are screen-based media in which a screen is pivotal in all educational learning situations, but it has received little scholarly attention so far.

Screens are mostly taken for granted and considered to be an ahistorical, neutral piece of hardware. Especially the latter point is hardly the case and this paper will demonstrate that at an earlier time in media research, specifically in early television research, the screen did play an important role. It will take seriously its history and ontology and claim that many present-day screen studies have forgotten its history, to the detriment of its users and all well-intended educators.

The rationale for this text is to address this under-theorisation of the role the screen interface plays in on- and offline social world cognition. In a first step, it will sketch a short history of screen-based distance education and assess the role technology occupied in its development. It will then turn to recent studies on online education and assess the advantages and disadvantages such pedagogies can deliver. In a third step, it will revisit early critiques of television and establish a screen ontology which, it is claimed, will be advantageous in addressing the failures, challenges, and chances of online education. In a fourth step, it will analyse the content of courses the author has taught over the last two years at Higher Education institutions in mainland China and abroad. Evidence will show that for some topics, for example, mainly theoretical ones, screen-based online teaching can indeed benefit most students, as long as an effort is made by both teachers and students to critically analyse not only the content provided, but also the media used in doing so; as for other classes, mostly those of a more practical orientation, the claim can be made that, even given the best efforts by all stakeholders, the result will be an inferior educational outcome for students when compared to face-to-face classes. For the majority of classes, a hybrid system of teaching seems to work best, a fact confirmed by a significant number of studies. In addition, and this is perhaps the lesson of the virus, its own technological underpinnings need to be addressed *expressis verbis* for such a system to fully benefit learners.

The History of Distance Teaching

Up until about 10 years ago, for most students, university life had not changed much for over 500 years and school life not for 2000 years or even longer: a professor or teacher stood in front of a class in a classroom and delivered a lecture or read from one of the then few precious

handwritten books and students took notes. The oldest evidence for schools goes back at least several thousands of years; Israeli archaeologists even claim to have found evidence of a school dating back 400,000 years (David 2017). Somewhat more recently, one may point to the Greek Λύκειον (Lykaion), founded by Aristotle in 334 BCE in Athens, or to Chengdu's 石室中学 (*Shíshì Zhōngxúe)*, founded during the Han Dynasty in 143 BCE, the oldest continuous school in the world. Other arenas of instruction are the Αγορά (Agora) of Athens and the Ωδείο Ηρώδου του Αττικού (Odeon Irodou tou Attikou), established in 161CE, again in Athens, then under Roman occupation, and which were public speaking/performance spaces. The oldest post-antiquity university, جامعة القرويين (Jāmi'at al-Qarawīyīn), was established in 859 in the Moroccan city of Fes and modelled on Greek precursors.

While still constituting the overwhelming majority of teaching practices, this time-honoured ex-cathedra physical classroom-based system has been quietly challenged for over two centuries in the guise of distance education. If one were so inclined, its temporal scope might even be extended further back in time. In this view, proto-distance learning can be claimed to have been in existence ever since the establishment of libraries, such as the Great Library of Alexandria (283 BCE), where one could read texts written far way in time and place.

Distance learning proper, if not online learning, began in 1728 with Caleb Philipps advertising in the *Boston Gazette* for students interested in short-hard expertise via mailed lessons. Sir Isaac Pitman set up his own distance learning business, again with short hand teaching practices in mind, in the late 1830s in London. Such postal distance learning received a boost in 1840 with the introduction of uniform postage rates across England, expanding the scope of the operation across the country. In 1858, the University of London became the first university to offer distance learning degrees, with Oxford's Wolsey Hall, the first distance learning college, founded in 1894. In the US, the first correspondence school, the Society to Encourage Studies at Home, was founded in 1873. In 1892, William Rainey Harper established correspondence courses at the University of Chicago with Wisconsin, Columbia, and many other universities following by the 1920s. These courses on offer often veered much from traditional university courses and successfully addressed themselves to housewives, miners and many other non-traditional students seeking mostly vocational training. Eventually, many of these schools and programmes would organise themselves into the International Council for Open and Distance Education (ICDE). Open universities, such as the British one established in 1965, Canada's Athabasca University (1970), Spain's National University of Distance Education (1972) and Germany's FernUniversität Hagen (1974), would also follow a similar educational approach (cf. White 2009 for an Australian perspective). Today, the Indira Gandhi National Open University in India is the largest Open University in the world with around 4 million students enrolled. With the arrival of broadband and stable Internet connections, most of the Open Universities would avail themselves of Internet-based teaching and learning opportunities and move much of their materials online.

Electronic media were quick to take advantage of the need of these institutions to cross vast distances. Starting in 1922, experimental radio lessons were broadcast in different regions in the USA, with broadcast radio becoming a means for extending learning to people in isolated and spread-out places, many of them in the Midwest. By 1929, radio education became more organized and broadcasting licenses were acquired by many schools and universities (cf. Fabos 2004). This system would pay off quickly, so for instance during the 1937 Polio outbreak in Chicago, a situation, as Foss reminds us, with an uncanny resemblance to our time:

> In 1937, a severe polio epidemic hit the U.S. At the time, this contagious virus had no cure, and it crippled or paralyzed some of those it infected. Across the country, playgrounds and pools closed, and children were banned from movie theaters and other public spaces. Chicago had a record 109 cases in August, prompting the Board of Health to postpone the start of school for three weeks.
>
> This delay sparked the first large-scale "radio school" experiment through a highly innovative – though largely untested – program. Some 315,000 children in grades 3 through 8 continued their education at home, receiving lessons on the radio.
>
> (Foss, 2020)

Especially in parts of Africa and across India, radio education remains an important pillar of distance education even today (cf. Jacob, 2020).

Quick to follow on the heels of radio education was television education. In 1954, the US National Educational Television (NET) started operating, subsequently to be replaced by the Public Broadcasting Service (PBS) in 1970 (cf. Lee, 2008). In the UK, BBC educational programming, named BBC Schools, started broadcasting in 1957, and was mainly geared towards children aged 5–16. In 2010 it morphed into "Class TV", broadcast on the CBBC Channel. In Germany, the *Telekolleg* commenced broadcasting in 1967 in Bavaria, at first called "Studienprogramm", and it would lead to GSCEs and/or Fachhochschulreife (advanced technical college entrance qualification). In 2016, it was rebranded as *alphaLernen* (alphaLearning) and is now offered via the internet. Given the rapid technological progress in digital communication, it was only logical then that, already in 1982, the Western Behavioral Sciences Institute in La Jolla used computer conferencing to deliver a distance education program to business executives. In 1993 the University of Illinois would begin employing online learning. The first online course for credit was offered in 1984 by the University of Toronto and in 1994, the Open University of Catalonia in Barcelona, the first fully online university, was founded. By 2021, almost all universities offer at least some of their courses and degree programmes online. There continues to be a huge market potential for such online education, as Soumik Sarkar reminds us: "The worldwide market size of online learning is approximately $187.87 billion in 2019, a 400% increase over what it was just six years ago", a figure which is about to double again by 2025 (Sarkar, 2020).

The traditional university system has come under further (rightful) scrutiny via additional technological advances, mainly through the further development of online education. Hybrid classes, flipped classrooms and massive open online course (MOOCs) have become the buzzwords of recent pedagogies. In 1989 Phoenix University began offering online programmes and by 2010, its enrolment counted over 600,000. In 2006 Salman Khan began producing short instructional videos in San Francisco, first for his own personal usage and then fairly quickly for commercial purposes. He set up his Khan Academy online, which by 2013 had over 250,000,000 video downloads. Udemy Inc., founded in 2010 by Eren Bali, Gagan Biyani, and Oktay Caglar, is another large US MOOC provider, aiming its course at professional adults and students. As of February 2021, its platform has more than 40 million students, 155,000 courses and 70,000 instructors teaching courses in over 65 languages and there have been over 480 million course enrolments. Students and instructors come from 180+ countries and 2/3 of the students are located outside of the United States. Furthermore, Coursera and Udacity, both conceived at Stanford, have also had a major impact on tertiary education with their own MOOC offerings. In 2015, Minerva University was founded in San Francisco, claiming to be

the first ivy-league-style online university, with an acceptance rate of only 2%. It would seem that their success speaks for itself.

Benefits of online education have been mostly developed via connectivist pedagogy, stressing the self-paced, asynchronous studying processes (Learner Control Principle) (Zaremba, 2004; Zimmerman, 1998); allowing for a theoretically universal and diverse student base; the expansiveness of Learning Management Systems (LMSs) such as Blackboard, Moodle or Canvas; possible gains for minority students, women and differently abled students, overcoming the constraints from limited university infrastructure; flexibility and convenience; cost reduction; standardised quality; better learning success through Multimedia Learning Approach and greater access to instructors (cf. Siemens, 2005; Downes, 2010; Moore, 2012; Major, 2015; Roberts, 2017; Al-khatir, 2014; Stripling, n.d.).

Over the last few years, though, the appeal of online courses has waned somewhat due to a combination of reasons, such as high drop-out and failure rates, with student completion rates sometimes as low as 7% (Parr, 2013). Other reasons why online courses are problematic are technical. For example, in March 2020, following students' request, the University of the Philippines announced that it would stop online classes, as the majority of students did not have the technical environment to participate in them (San Juan, 2020). Other issues include legal questions, such as, who owns the visual material created – the teacher or the institution? A recent case from Canada highlights this issue. A student from Concordia University in Montreal wanted to contact the teacher of a class he was taking, only to find out that the instructor had died two years earlier while the university gave the impression that the teacher continued to give classes. (Elks, 2021).

It is also clear that many students and teachers dislike online classes. In a poll conducted in February 2021 at my home institution, more than 65% of all students stated that they preferred in-person courses. Whether students do better in online courses vs in-person ones is hotly debated; at least for high school students in Germany, research shows that for online classes, students do not do as well in terms of quantity and quality of material learned (Wößmann, 2020), leading to a learning loss of about 20% (Fokken, 2021). After the end of COVID, it is estimated that 15-20% of children need extra homework help (Fokken, 2021) According to Wößmann (2020), in Germany, learning time was cut by half in home-schooling; a similar study in the Netherlands suggests that only eight weeks of school closure elicited a learning deficit of 20% compared to face-to-face education. If one scales this results in a wage loss of about 3-4% across one's working lifetime

Further criticism of online education include lack of dedicated studying space in domestic spaces, unreliable technology; lack of proper training, guidance and self-discipline, discipline-dependent strictures, such as exist in medical school or practical training course such as filmmaking; additional time needed by teachers to organise, upload and grade course materials; and lack of cultural sensitivity training for teachers involved in teaching curses globally (cf. Kaplan, 2016; Anderson 2011; Evans, 2008).

As the COVID-19 crisis continues, new issues with online interactions have also arisen. Many people are beginning to suffer from a general COVID-19 fatigue, here not necessarily generated by the virus itself, but stemming from the measures continuing to be taken over and over again to reign it in. In the business and education world, much of this has to do with the most-used business tool coming to the fore during 2020: video calling. It became a must-have central piece of business, education and leisure communication. As time went on, though, with

billions of calls being made, some issues with it did appear as well. Thus, in April 2021, Jamie Dimon, CEO of JPMorgan, declared: "I'm about to cancel all my Zoom meetings." (Murray, 2021), indicating that in-person meetings are far more effective than virtual ones and that most of his workers will return to in-person work by the fall. Even Eric Yuan, CEO of the most popular video call application, Zoom, admitted that he suffers from Zoom fatigue and no longer schedules back-to-back meetings (Yuan, 2021).

And indeed, a new illness, coined Zoom and Exhaustion Fatigue (ZEF), has been diagnosed with many individuals suffering from it. Much of it is related to what Baileson (2021) has coined "Nonverbal Overload". Reasons for it are:

> *Eye Gaze at a Close Distance*: People in an elevator tend to look away from the faces of others by looking down or otherwise averting their gaze in order to minimize eye contact with others.
>
> *Cognitive Load*: On Zoom, one source of load relates to *sending* extra cues. Users are forced to consciously monitor nonverbal behavior and to send cues to others that are intentionally generated (cf. Clark, 2011).
>
> *An All Day Mirror*: Studies have shown that the tendency to self-focus might prime women to experience depression.
>
> *Reduced Mobility*: In essence users are stuck in a very small physical cone, and most of the time this equates to sitting down and staring straight ahead.

Problems do not stop here. Recent research by Fauville et al. (2021) reveals that Zoom Fatigue is also a gendered, an age, a personality related, and a racial issue. The study shows for instance that women are more susceptive to Zoom fatigue than men. These are serious issues and would require closer monitoring. Another point in this regard is the lack of external signals used in physical face-to-face communication. While the 1960s idea that 70-90% of our communication rests on non-verbal cues has largely been debunked (cf. Eunison, 2021, p. 256ff), there nonetheless exists information external to the screen which is lacking in online communication, as it significantly separates verbal from non-verbal interactions in its simulation and raises new concerns about non-equality. It is important to stress here, that these are relatively new phenomena and require the creation of new solutions, also in one of the areas of application, online education.

Recent Research on Online-Education

While as we have seen, distance learning theories and approaches have been in existence for many decades, it was actually due to the development of the internet that distance education became a mass phenomenon and entered the mainstream. Over the last decade or so, many new theoretical assertions and approaches have been devised to account for this development. Thus, Gilly Salmon (2000, 2020) developed a five-stage model of e-learning and e-moderating that has proved to be a good starting point for online educative interactions. It includes 1) individual access and the ability of students to use the technology; 2) the creation of an online identity for online socialisation (cf. Kalyuga, 2000); 3) dissemination of information to students; 4) collaborative interaction; and 5) linking the online system with the outside world, all under the mentor- and facilitatorship. Another pivotal point seems to be the design of the learning environment, be it physical, blended or online (cf. Rau, 2019; Allen, 2007; Vaughan, 2010).

Misoch (2006, pp. 63–94) discusses various online communication models such as Social Presence Theory, Restriction Models, the Social Cues Filtered Out Approach, Media Richness Theory, Media Synchronicity Theory, the Theory of Electronic Nearness, and a generalized Digitalization Approach and comes to the conclusion that all of them have their specific merits. Finally, Aparicio (2016) and Kentnor (2015) provide a good overview of the history of e-learning and the creation of an e-learning systems framework, inclusive of the by now accepted principles of pre-training, contiguity, segmentation (cf. Spanjers, 2011 and 2012), signalling, and expertise.

These theories have since undergone some rigorous testing. Case in point is the so-called "seductive detail effect" which has become more pronounced with the rise of PowerPoint presentations (Harp, 1998; Magner, 2014). If Sweller and Chandler had already proven in 1994 that a mixture of images, text and narration helps students learn better, more recently, researchers have focused on what kinds of resources should be included in online course materials and which should not. The above mentioned seductive detail effect stipulates that students learn better from information that excludes rather than includes seductive but non-relevant material or details, as an overload of the working memory might occur due to attention distraction (Florax, 2010; Scheiter, 2014), schema interference or coherence disruption (Baddeley 1974; Sweller & Chandler, 1994; Park 2011, p. 6) At the same time, this effect is dependent on the individual learner; as long as "learners have enough resources free to use this non-redundant and interesting, but irrelevant learning material" (Park 2011, p. 9)

Ibrahim (2014) examined the effects of three educational approaches to online learning. These were *segmenting* learning material into smaller units, *signalling* to direct students' attention to relevant information, and *weeding* to remove any non-essential content (SSW). Results of his study revealed that the SSW principle allowed students to outperform a non-SSW control group in knowledge transfer, structural knowledge acquisition and ease of learning. Design and teacher interaction in online learning environments is therefor of the utmost importance.

Similar to Sweller, Harskamp's 2007 study demonstrated the importance of the multi-modality principle, that is, that engaging several senses of a learner in teaching heightens their learning ability. In particular, he corroborated the fact that the presentation of visual material in liaison with narration works better than visual material paired with text only (cf. Hattie, 2012 for similar results). In a related study, Pritchard (2009, p. 109) confirmed that "in online distance learning situations, dialogue is considered as an essential element of the process of learning." The element of teacher-learner and learner-learner interactions is critical for any successful online teaching. The absence of any such interactions will in all likelihood be detrimental to online education, as evidenced by the already mentioned high dropout and failure rates in completely self-determined learning environments. This is also the experience of Ulrich Zierer, Chair Professor for Pedagogy at Augsburg University, and one of the most prolific pedagogues in Germany when he states: "Wenn Studierende völlig eigenständig lernen können, degeneriert Freiheit zu Beliebigkeit". (If students are allowed to study completely independently, this freedom degenerates into arbitrariness (Zierer 2021, p. 35)

Another study by Johnson (2014) demonstrates this need for sociality and cooperation in learning as well. Unlike competitive and individualistic learning, cooperative learning based on social interdependence theory has proven to be the most viable model for knowledge acquisition, retention and application as it "increases students' efforts to achieve, encourages positive relationships with classmates and faculty, and improves psychological health and well being [sic]". This is true for online as well as offline teaching. McLaren et al. (2011) examined

the politeness principle (politeness in teaching increases students' learning) online and discovered that College students with low prior knowledge of the material performed better on subsequent problem-solving tests if they learned from the polite tutor rather than the direct tutor, whereas students with high prior knowledge showed the reverse trend, again an important cue for the design of online classes (cf. Kartal, 2010 for similar findings).

Furthermore, a study by Tabbers (2001) tested the influence of the presentation format on the effectiveness of multimedia instructions on the basis of the Cognitive Load Theory. He reported that the results "show that replacing text with audio is only effective when multimedia instructions are system-paced" and not self-paced, that is, when a social learning situation exists. In 2012, Joachim Reinwein replicated CLT's modality and moderator effects but also questioned some of its theoretical bases. Jorge Reyna (2016) takes a more student-centred approach when examining Flipped Classrooms (FCs) and states that while they have become very popular, students are not given proper support when transiting from a traditional to an online classroom. He also bemoans deficits in research on FCs, such as the lack of "a rigorous and consistent approach, effective theoretical frameworks, and evaluation structures."

Rau and Schmidt (2019) examined blended classrooms and detected a differentiated picture for the variables of Physical Engagement, Cognitive Load, Embodied Encoding, Embodied Schemas and Conceptual Salience. They report: "We tested effects on students' learning of three concepts. Representations that induce helpful embodied schemas seem to enhance reproduction. Representations that allow for embodied encoding of haptic cues or makes concepts more salient seem to enhance transfer. […] Given the high costs of integrating physical representations into blended technologies, these findings may help developers focus on those learning experiences that could most be enhanced by physical interactions." Their research underlines the fact that haptic experiences prove to be highly beneficial for at least some specific knowledge transfer actions and that it will remain the task of a future technology to successfully transfer such experiences into the virtual realm.

The studies by Ho (2002) and Yuan (2010) confirm these findings. Both of them illustrate that certain types of activities can be conducted online, but not all elicit positive results. According to Yuan, one area where that is the case, is conceptual geometry. In her study she developed virtual manipulative, polyominoes kits for junior high school students in Taipei, with the results showing that the virtual group was better at using new symbols and at considering the influence of symmetry and rotation on the figures. Also, this groups' explorative manner superseded that of the non-virtual one. Another study by Chini (2012) involving physics learning confirmed that online learning is at least as good if not superior to offline learning. Barrett (2015) confirmed this for organic chemistry.

It is also important to remember that while some strategies work well offline, this does not necessarily translate to Virtual Learning Environments (VLEs). Studies by Broadbent and Poon (2015) and Broadbent (2017) concluded for instance that Self-Regulated Learning (SRL) strategies were used more often in online education than in blended classrooms, but that there were drawbacks as well: "The results show that online students utilised SRL strategies more often than blended learning students, with the exception of peer learning and help seeking. […] [K]ey SRL predictors of academic performance were largely equivalent between online and blended learning students. Findings highlight the relative importance of using time management and elaboration strategies, while avoiding rehearsal strategies, in relation to academic subject grade for both study modes." (Broadbent, 2017; cf. McGee, 2012). She

cautions therefore that one should not assume that online learning by itself promotes SRL strategies usage.

Overall, the picture these studies paint is a diverse one; it seems that there are certainly benefits to be reaped from online education compared to its offline equivalent, but that these benefits heavily depend on subject, set-up of VLSs and facilitator-learner and learner-learner interactions. The next section will confirm these results via the author's personal teaching experience.

Teaching in Times of COVID-19 – Case Study

I have been involved in online/blended classes since the 1990s and have always striven to incorporate technology into my teaching. Additionally, I have been teaching classes in the humanities and not the natural sciences, and this of course limits the results of the general applicability of my teaching experience. Another limitation of my experience concerns the class compositions. I have been teaching students geographically based in the USA, in the UK, in the Philippines and in China, but also international cohort diverse undergraduates and postgraduates (cf. Williams 2004 for differences in cohorts and student generations). The results of classes taught are mixed, though. As the above cited studies made clear, the success of online education is at least partially dependent on who the learners are, whether they are new students or seasoned ones, for instance. As also became clear above, it is mostly mathematical and natural sciences that seem to profit from online teaching. As such, the remarks below are more anecdotal and since they are rooted in the humanities and social sciences, necessarily limited in scope; yet, I would claim, they reveal certain trends that are helpful to observe when devising ways to be successful in online teaching.

In the mid-2000s I taught a pure online MA class in Media Studies for a tertiary education institute in the Philippines. Having taught at the same institution in person before, I was aware of the level of students and their eagerness for exchanging information and a personalized teaching style. While students enjoyed the online class, their greatest regret was that there were no offline meetings possible, something they felt clearly hampered their progress and negatively affected their success. It was not that they did not enjoy their class, teaching evaluations spoke to that effect, but the person-to-person teaching they were used to was lacking, and no amount of online availability and care seemed to be able to make up for that.

By now, of course, VLEs have become vastly more sophisticated and training on them in particular and on online teaching and blended learning in general (e.g. the Hyflex method) has made most teachers better suited for availing themselves of the opportunities online teaching brings with it. However, strictures do remain and they continue to be related to interpersonal and disciplinary issues, just as they did before. From 2018-20, I have had the opportunity to teach several intensive courses offline and online to comparable mixed undergraduate cohorts of 2nd and 3rd year students at a University in Shanghai. Course subjects varied and included Filmmaking, Public Speaking, and International Marketing.

Perhaps not surprisingly, offline teaching worked best for all three subjects, as the student learning successes demonstrated. Overall. the quality of their work in the offline courses was of a considerably higher standard than in the online ones. Their comments in the evaluations also spoke to their appreciation of classroom interactions. When it came to the online classes, there was a stark divide. The International Marketing class worked best and students would gain grades almost as good as in the offline line counterpart.

Public Speaking was, quite frankly, a disaster online. In the offline classroom, it had been the most interactive of the three classes and an enjoyable experience for all; interactions between participants was at an all-time high as students were able to learn from each other and from direct and timely interventions by their teacher. The online class could not provide such an environment and all uploaded materials, visual cues and pre- and post-class mediations were unable to make up for the lack.

With filmmaking, it was a mixed bag. The class included students who were mostly non-majors in film and communication studies, and taught everything from the history of filmmaking to the shooting and post-editing of student films as their final project. Film quality in the offline class was much higher than that in the online one. On reason for this is that in the offline classroom, the final film was a group project, whereas online, it had to become an individual one as students were geographically scattered and could not properly collaborate. The nature of filmmaking is overwhelmingly based on group effort and it proved impossible to migrate and simulate such group processes online. Furthermore, some students were able to garner the support of family members and friends, thus moving the project towards a group one, but others were not, thus violating the fairness principle. Not all was lost, though. When looking at individual tasks, a specific pattern evolved. While the actual shooting of the film was probably the most difficult thing to do alone, students succeeded much better at other tasks, at times even more successfully so than in the offline class. Case in point was scriptwriting, a skill that can be learned and practiced by oneself, with a myriad of tutorials available online. The same was true for post-production at which some online students truly excelled.

This experience led me to theorise that the higher the level of interaction required in the classroom, the harder it will be to make online classes work. This is not to say that it cannot be done, just that the effort to do so will have to redoubled, a fact that has been called the course-and-a-half phenomenon (McGee, 2012), meaning that efforts by teachers and students need to work much harder to achieve similar results as offline teaching. And even then, it appears that a true equivalence cannot be achieved and that it would at least need additional real-time synchronous sessions to enable students to the fullest degree, for example, have informal after-class discussions and inter-personal dynamics in at times non-directional and non-intended ways. But other valuable support can indeed come from online sources, such as additional workshops and videos.

Evidence from businesses points in the same direction as the experiences made at universities and schools. Thus, Lothar Tremmel, VP and Head of QCSR (Quantitative Clinical Sciences and Reporting) at CSL Behring and a statistics and communication specialist, stated in a class-screened Zoom interview (23 October 2020) that global companies such as his are used to distance working, but even in this industry, in-person meetings are preferred by far, thereby following Jamie Dimon. In particular, he cited diminished communication data via e-meetings for this preference. He stated: “You can maintain relationships online, but it is much harder to build them”. At the same time, he acknowledged that at least some participants did like them, for instance people on the periphery of the company and those not in in-groups as it is a levelling mechanism. He also shared some of his ways of addressing these issues, such as adding virtual hang-out to the meeting, so that it’s not just work you are discussing; to make sure everybody keeps their camera on; interventions by moderators to ensure inclusivity; and to use Zoom gallery view to level the experience. Without doubt, all of these suggestions can be very helpful also in education setting, but, as discussed above, at least some of them come with their own issues, for instance the camera-on rule which might lead to zoom fatigue and the all-day mirror syndrome.

One last point should be made here, and this perhaps an obvious but nevertheless pivotal one. When engaged in online teaching via screen media, one needs to learn to love the camera. The limitations of the screen cannot be overcome, but they can be mitigated by camera skills communication specialists and film and TV actors learn during their training. This perhaps was also the one point in the public speaking class that could be better trained for online than offline. Only then will one be able to communicate effectively with others online.

Given all these strictures, challenges and chances for online teaching, one might be tempted to assume that it only requires further elaboration of methodologies to have successful online classes. This view is tempting, but somewhat misleading, as it does not take into consideration the very basis of online interactions. That basis is the screen and an understanding of its ontology is critical for understanding the specific challenges it sets for online (visual) communication.

Screen Studies

The idea of setting a barrier between oneself and nature is as old as humanity itself, with cave dwellings and built environments in one way or another having been used for millennia, if not even millions of years for our ancestors, as excavations from the Wonderwerk Cave in South Africa seem to suggest (University of Toronto 2008). This kind of protection was cherished, but it did have its limits, as it prohibited one from safely surveying surrounding areas. Thus, the idea of built-up environments was born which could then include windows. Etymologically deriving from Old Norse *vindauga*, (*vindr* 'wind' + *auga* 'eye'), they would bestow eyes upon a building, and allowing the eye of its inhabitants to interact with a windy outside while keeping the rest of the body safe. Another etymology proceeded via the Latin word *fenestra*, probably derived from the old Greek φαίνειν, "to show, to *bring* to *light*, and made it into Spanish and German. Over the centuries, humans began experimenting with visually permeable materials to cover these openings; in China, Korea and Japan, paper windows were widely used and by around 100 CE the Romans were the first to use glass for windows. In England, flattened animal horn had been used before glass replaced them in the early 17th century.

In the 1930s, another kind of device would figuratively transport the light from the outside, if not the wind, into people's living spaces: the Television set. After early experiments in the late 1920, the first commercially made cathode-ray-tube-based television sets were sold in Germany, (1934), quickly followed by France (1936), Britain (1936), and the USA (1938). In time it would establish itself as the globally dominant mass medium. The principle of the window was thus transformed into a new device which opened a window to the world, stretching one's purview far beyond one's immediate surrounding. It allowed for data to flow in to enlighten its users while keeping at least the majority of them, superficially safe, roughly along the lines of George Gerbner's cultivation theory. No matter what kind of mass media philosophy its makers followed, be it a more entertainment directed one, as would become dominant in the US, or a more informational one (with most of Europe here following the British lead), one constant would underlie them all: a screen inserted between the content and the viewer, literally "intro-ducing" the world and at the same time keeping it at bay. This doubling up of reality is nicely captured by Boym (2001, xiii), who when discussing nostalgia in cinema (and, by extension, TV), delineates how both double reality in a specific way: "A cinematic image of nostalgia is a double exposure, or superimposition of two images – of home and aboard, past and present, and dream and everyday life. The moment when we try to force it into a single image, it breaks the frame or burns the surface." This is not only true for nostalgia, but for the whole televisual reception process. The conflation of TV image and reality, which belongs to any suspension of disbelief process and is required to successfully

"believe" the image, does justice to neither, not to reality nor to the TV image, and "burns the surface" to the detriment of the viewer. TV tears at the fabric of reality and imposes upon its audience an unsolvable cognitive dissonance.

Just like any new medium, television had detractors from the start. Many of them were the usual and expected suspects, namely those media institutions which television threatened. Accordingly, film, radio and newspaper companies were very vocal in airing their criticisms, variously referring to its diminished viewing quality (as opposed to cinemas), the inability to properly concentrate on the spoken word as a cue for imagination (as compared to radio) and the lesser argumentative rigour in information presentation (as compared to newspapers).

But there were further serious criticisms to be dealt with. These critiques originated from within the academe and voiced more fundamental criticism. When considering TV criticism, the overwhelming majority of literature centres on content broadcast. While this is of course very important (cf. for instance Cullen 2021 regarding the distortion of history via television drama), this is not the topic of discussion here. The angle adopted here is much more related to the fundamental criticism of the materiality of the screen involved and the reception situation this creates. This was something that was thematised early on. Thus writes Engell, "Early television theories drew quite far-reaching conclusions from the – at the time – tiny size of the screen: the television image penetrated everywhere more easily, it preferred 'talking heads' and set itself in the place of the real interlocutors, and it made the world smaller." (Engell, 2021, p.4). In this kind of criticism, the distorting effect of television vis-à-vis reality is stressed; it is viewed more as a distorting mirror than a real-world reflection. Screens sizes have expanded considerably since then, but the promised (and always frustrated) fungibility of the world it alleged then and continues to do so today, has remained.

Another important criticism launched at television came from philosopher and sociologist Theodor W. Adorno. In 1954, he wrote:

> The spectator feels on safe ground all the time. This longing for "feeling on safe ground"-reflecting an infantile need for protection, rather than his desire for a thrill-is catered. The element of excitement is preserved only with tongue cheek. Such changes fall in line with the potential change from freely competitive to a virtually "closed" society into which one wants to be admitted or from which one fears to be rejected.
>
> (Adorno, 1954, p. 216)

Here Adorno comments on the safety the televisual window to the world promises, but cannot keep. While the viewer remains at home, the television only admits adverse news of the world in a tongue-in-cheek style, framing any disquieting news as equally inconsequential as other programmes such as sit-coms, adverts and cartoons. The closed society which discusses the explanations of the world seen on the screen at the water cooler does not reflect or question its own reception status and thus falls prey to TV's reality distortion qua screen-induced reception circumstances.

Further criticism of the screen has been introduced by Paddy Scannell when he writes that switching on a TV is equivocal with a Heideggerian Being-in-the-World (Scannell, 2014), a sine-qua-non determining and limiting our actual (self-)understanding of the world. Scannell cogently demonstrates that there appears a fundamental misconception in that many viewers mistake the screen window as a 1:1 presentation of the world and do not recognise it as what it phenomenologically is: a carefully edited and tendentious re-presentation of reality, since it

can never reveal an actual presentation, despite its promises. As Abramson already stated in 1974, a television image never actually becomes manifest: it consists (or manifests itself) exclusively in being drawn or written without ever being complete and present (Abramson, 1974, pp. 48–50). At best, it can therefore be considered as an instance of "ghost-writing". While Abramson was here referring to the actual formation of the PAL or NTSC television image, the same is also true for the digital image which prompts pixels to appear only in specific sequences.

But the television screen does not only simply simulate reality, its ontology requires it to try and usurp, and eventually, possibly supersede it. Here its users play a central part. Engell (2021, p. 15) states that television as a whole "behaves ontographically toward its surrounding world into which it enters and intervenes, including its anthropo-mediatic entanglement with its users". It impinges on the reality of its reception situation and forcefully generates its own epistemic reality. Its insidiousness is such that it pretends to be only an option for understanding reality, and thus does not vie for a suspension of disbelief, as a cinema experience suggests to its participants within a clearly defined and limited time span. The suspension of disbelief screens desire and insist upon from their users are of an eternal kind, in competition with and attempting to displace reality. And herein the screen's duplicitous danger lies.

The television screen remains the ur-screen of our interactivity with the world. Its functions may have since been transferred to other screens, such as those of our computers, mobile phones and the Situation Rooms of the world's security industries. Its function, though, as a duplicitous device promising safe realities and always failing to deliver them, have remained. More than ever before, we are unconsciously reliant on their promise of affording us a glimpse through the looking glass and we have only recently become somewhat suspicious of them. If the black monolith from Stanley Kubrick's 1968 *2001: A Space Odyssey* seems the benign, if mysterious, trigger for transitions in human development, Charlie Brooker's *Black Mirror* TV series (2011-2019) takes the threats from an overreliance on such mirrored screen devices more seriously. And it is left to Daney (2000) to speak of the troubled relationship between the screen and reality: "The transparent continuum that clings to the real takes its form, the bandages that preserve for us the mummy of reality, its still living corpse, its eternal presentness: that which allows us to see and protects us from what is seen: the screen." (Daney, 2002, as quoted in Ng (2014: p. 78))

As already pointed out, a big contributing factor to the power of the screen are its viewers and their relationship to the world they meet through the screen. This is sentiment has of course been in existence for many years already, as for instance Charles Baudelaire aptly noted in one of his poems, *Les Fenêtres*:

> Celui qui regarde du dehors à travers une fenêtre ouverte, ne voit jamais autant de choses que celui qui regarde une fenêtre fermée. Il n'est pas d'objet plus profond, plus mystérieux, plus fécond, plus ténébreux, plus éblouissant qu'une fenêtre éclairée d'une chandelle. Ce qu'on peut voir au soleil est toujours moins intéressant que ce qui se passe derrière une vitre. Dans ce trou noir ou lumineux vit la vie, rêve la vie, souffre la vie.
>
> (He who looks out at the world from an open window never sees as many things as he who looks at a closed window. There is nothing deeper, more mysterious, more fruitful, more shadowy, or more dazzling than a window lit by a candle. What we can see in

> daylight is always less interesting than what happens behind a windowpane. Deep in that dark or luminous aperture, life lives, life dreams, life suffers.)

While the candle has given way to a backlit screen, the appealing and compelling mystery of what happens behind closed windows continues to fuel our love for them. In her magisterial work, *The Virtual Window* (2006), Anne Friedberg speaks of this "temporal flânerie" (6) that the screen affords us and demonstrates how the window as an architectural opening for light and ventilation ceded its priorities to the modern function of the window, namely, to frame a view. This, she claims, is still the case, despite the multiplicity and ubiquity of screens:

> As the beholders of multiscreen "windows," we now receive images-still and moving, large and small, artistic and commercial in spatially and temporally fractured frames. This new space of mediated vision is post-Cartesian, postperspectival, postcinematic, and posttelevisual, and *yet remains within the delimited bounds of a frame and seen on a screen*.
>
> (Friedberg, 2006, p. 7, emphasis by author)

Much of Friedberg's argumentation gainfully returns to Alberti's 1435 metaphor for the painting (pictura) as an "open window" (aperta finestra) and his subsequent introduction of perspective within the frame of such a painting. Explains Friedberg (2006, p. 26): "The window serves as a symptomatic trope in these debates, because it has functioned both as a practical device (a material opening in the wall) and an epistemological metaphor (a figure for the framed view of the viewing subject)".

It is this performance of "perspective" that, at least in part, explains the draw of the screen. Albrecht Dürer called it "durchsehen (seeing-through: "Item Perspctiva ist ein lateinisches Wort und bedeutet eine Durchsehung" (Item perspectiva is a Latin word meaning a seeing-through)". The film theoretician Erwin Panovsky would pick up this phrase as the first sentence of his highly influential essay, "Die Perspektive als 'symbolische Form'" (Perspective as "Symbolic Form', 1927), and drawing a continuous line from Renaissance painting to film theory (cf. Friedberg 2006, pp. 39ff.) Here Dürer's "Durchsehung" is the problem of course as it promises an increase in cognition, but only along the lines suggested by the screen. This is not to say that this point made is simply reverting to a view of a naïve passive audience sitting in front of an omnipotent screen. Ever since Jauss/Iser's Reception Aesthetics and the beginning of audience research in the late 1960s, the relationship screen-audience has been redefined in significant ways. What I am suggesting, though, is that any teaching of content needs necessarily to reflect the transmission and reception mechanisms and situations applicable. Otherwise, the framing of any content will be left out to the detriment of any possible transmission and co-creation success. And this is true for both, the traditional lean-back medium of TV as well as the lean-to screens of computers and mobile phones.

In this regard, it is also imperative to remember that virtual images are a second order materiality, arising from the screen. It is their seductiveness and our desire to equate them with or replace and/or supersede a first materiality, as aptly described by Baudelaire's lines, that make them at least challenging and, at worst, a danger. Unreflected, the dream factory produces only nightmares. This does have to do with Baudrillardian simulacra, phantasms living in their own world, but even more so with the virtuality of the world evoked through screen media which oscillates between these simulacra and the residue/re-presentation of the real in the virtual world and its claims to be the real. The virtual's claim to (historically, at first masculine

and then feminine) virtue is then only a short, wishful step away, but etymologically rather removed (cf. Hollandbeck, 2020).

As an aside, in this context it is well worth recalling that the visual aspect of the move from analogue to digital is only one of many; another is the psycho-haptic one. Thus, Drawert (2013) claims that with the move from hand to computer-screen writing and its promise of an infinite screen, humans have lost a "nachprüfbaren Spurenverlauf" (verifiable process of leaving traces) and "das Literarische als Einschluss des Unverständlichen im Verständlichen" (the literary as inclusion of the incommensurable in the intelligible). And while writing itself does of course continue in the digital world, it is different kind of writing, a writing-towards and less a writing-inwards (cf. Briel, 2012) Be that as it may, its application in teaching processes remains a valuable asset

Ever since their inception 60 years ago or so, screen studies have been roughly divided into a school that sees the screen as a positive and liberating force in the development of humans and one that doesn't. In a large part, the former view was shaped and supported by scholars such as Marshall McLuhan who saw TV as a place of maximum involvement with the world, a "cold medium" that integrates its viewers into the picture, leading to the "global village (McLuhan 1964: 43; in a similar vein, cf. Nannicelli 2017, who examines TV as an art performance) and others who were afraid of its seductiveness above all (Adorno, Anders, etc.) The latter view would be mirrored by Lorenz Engell (2021, p.4), who sees TV as a "the prototype of a picture that ultimately functions a switch itself", and manifests itself in and as an "anthropo-mediatic process" (Voss 2010, quoted in Engell, 2021.), as a way to shape individuals via the media consumed and interacted with. Engell's phrase for this process is "ontographic", the power of TV to write one's own being though an "ontography of separation" and at the same time one of reciprocal inscription. (Engell 2021, p. 16).

Other prominent critics of the television screen include Stanley Cavell, the eminent Harvard philosopher of film who saw TV as a "current of simultaneous event reception" (Cavell 1982, p. 85) and maintained that it is wrong to claim that one is "watching TV", as it is rather "witnessed and surveilled." For him, this surveillance come at a heavy price though: "[T]he surveillance of the world by television creates a maximum lack of participation" isolating viewers from, rather than connecting them to the world. "The monitoring of television leads to the greatest possible distance between the uninvolved viewers and the world… Television shields us and disconnects us from the world." (Cavell, 1982, p. 90).

Niklas Luhmann, sociologist and co-progenitor of Systems Theory, saw another problem with the system of TV. He claimed TV to be a "non-consensual reality". Viewers justify before themselves what they see on TV as – at least initially - unreal and perhaps manipulated, but simultaneously also believe that others viewers believe it. (Luhmann 2000, p. 110; cf. Engell 2021, p. 33ff). This trick allows viewers to do both: to not believe in the image, claiming cognitive superiority over other less media-savvy viewers, and yet, qua being a member of a greater audience, accept it as one of the building blocks of a non-consensual reality to be discussed during water cooler conversations the world over.

In sum, none of the aforementioned question the at least partial usefulness of television, but they do have grave concerns about it at the same time. For a short time, in the early 2000s, it seemed that broadcast TV was dying a slow death at the hands of the Internet, together with the former's competitors, radio and newspapers. With the rise of streaming services such as Netflix, Amazon Studios, AppleTV and Disney+, it has since proven its extraordinary

resilience, though, and extended its reach to any and all of the multiplying screens around us. But what has not changed, are the iterable simulatory processes it forces upon its viewers and the promise of the evocation of reality, arguably on an even grander scope than before, while, at the same time, the reflection of its creation processes continues to decrease. And that is the worrying part.

The Future

Over the length of this paper, I have attempted to indicate some of the issues online/distance education is facing in the wake of COVID-19 upheaval in particular, but also due to an unprecedented technological paradigm shift over the last ten years or so in general. It became clear that screen studies, the erstwhile solitary domain of film studies departments, are now rapidly becoming a vital area of study in education and pedagogy as well, a fact that brings with it much needed expertise, but one that also delineates important challenges. Underlying it all is the ontological and ontographical lack screen interactions evidence, and one of the main tasks of an expanded screen study programme is to address how such a fundamental lack can be addressed. One of the first steps is to acknowledge to oneself and to one's students that this lack is a serious issue interfering with our relation to first-order realities, as their representations are always already technologically premediated and predetermined. While it is clear that, on a fundamental basis, this simulatory deficit will not and cannot disappear, redesigned graphic user interfaces and their study can make up for at least some of its insufficiencies. Case in point is the inclusion of senses other than, first and foremost, vison and sound, for instance, via the touchscreen. Theorized in the 1960s, first experimental versions were built in the 1970s and then applied in airplane cockpits and car dashboards in the 1980s. In 1987 the Casio pocket computer came out and in 1993 IBM's Simon, the first touchscreen phone, appeared. In 2007 the first mobile phone, LG's Prada was fitted with this technology and today it has become ubiquitous, oftentimes making mice redundant. The direct, dispersed haptic experience became thus a novel and very popular way of interacting with a screen and another step in the lean-to development of human-computer interaction, with many of its usages applying directly to educational programmes. Needless to say, further usability studies in its educational applications are still required in order to ascertain what its actual positive impact is and it can be further improved upon in the future.

Screen theories have since become more sophisticated, in line with the development and multiplication of increasingly interactive screens, such as in the field of biometrics where screens now read our faces more so than vice versa, as was the case for over a hundred years prior. For now, our informational intake is still overwhelmingly determined by our limited interactions with traditional screens. Here we might actually argue that COVID-19 was a throwback in that forced us to momentarily return to a (purely) digital world, with all the absences it entails. In the future, education will increasingly consist of scalable navigation between and interaction with the digital and non-digital world. This is already the case for art education, as Tavin et al. (2021) have posited, when they interrogate technologies applied in current interactive art classes.

Before COVID-19, humans had already begun to create a post-digital world, a world described by Nicholas Negroponte as early as 1998 in the following way: "Like air and drinking water, being digital will be noticed only by its absence, not its presence", similar to electricity and water supply, things that many people in the more affluent reaches of the world take for granted. In 2016 the UN General Assembly adopted a non-binding resolution declaring internet access a human right. From today's perspective, for many Negroponte's view might already sound

historic and therefore "intended absence" rather than "absence" might be a better term to use, as it implies things that the digital cannot perform (anymore), also in education. For many others, though, (stable) online access continues to be an unattainable dream, and this is another important lesson the virus has taught us: the realization how deep and apparently unbridgeable the global digital divide is.

In 2016, Grace Woo reminded us of the fact that our visual interaction with reality is inextricably linked with the mostly undetected development of ever increasing numbers of devices monitoring and interacting with us. In "On Creating an Unobtrusive Coded Reality" (2016), she writes:

> Our mind's control center for interpreting the visual world takes up one of the largest chunks of our brain. It's the primary way most of us experience the world. Thus, it only makes sense for our devices to understand this environment too. We have always built buildings with aesthetics in mind. It only makes sense that we now have to consider our devices and make them interact with our environment too.

Here, "unobtrusive" sounds too benign to be true, and, indeed, it can be argued that just as with the disappearance of our always-on status from our consciousness and the multitude of screens attempting to usurp a first reality, VR screens and AR usage are questioning our ontological being-in-the-world. We are at a stage where screens have begun to sense/censor us more than we do them and this in a clandestine way (cf. Ng 2021). Furthermore, we are certainly on the way of moving away from traditional film theory's desideratum of more cinema to get to the truth and towards augmented realties, such as video mapping, with the image becoming the basis not for more but for less (rigid and predefined) truth. (cf. Ng 2014, p. 85). Friedberg is probably right when she writes that "Perspective may have met its end on the computer desktop" and that in the virtual age, it is "[this] new circuitry [that] takes us beyond and through the window, a defenestration that has new risks and pleasures. In this vision, the 'age of windows'- and by extension, the age of screens-has, as H. G. Wells predicted, reached its end." (2006, p.2, 244).

Indeed, the screen as we know it, with its ontological strictures and faux-epistemological aspirations, might be nearing its end, and while this development will still take some more time, the writing's on the wall. In March 2021 Microsoft announced that its Microsoft Teams environment, along with Zoom one of the profiteers of the virus, will transform to Microsoft Mesh. This is the company's vision for the future of augmented and virtual reality, or *mixed reality* in Microsoft terminology. A prototype is already available, in which users are represented by avatars grouped around a table for instance with some features of real-world communication employed, for example, head-turning when speaking to someone. It remains to be seen how much this will be able to "normalise" virtual reality features (cf. Dawley, 2011; Singal 2011)) and how Microsoft intends to overcome, for instance, Virtual Reality Motion Sickness (VRMS), so far one of the main deterrents VR environment developments.

It is these new risks and pleasures then that require careful navigation in education. If the digital world portends many such ontological pitfalls, as outlined above, a term that over the last 10 years or so has gained some traction might offer a way out. The term "post-digital" appeared for the first time in 2010 when Cascone (2000) and Andrews (2000) used it, albeit in different contexts, but with the idea in mind that by the early 2000s it had become imperative to re-interpret and extend the meaning of the word "digital" which by then had ossified to and became solely equivocated with the idea of something "better".

However, even the idea of the post-digital needs to be pondered carefully, as Cramer (2015) states:

> Silicon Valley utopias and post-digital subcultures […] have more in common than it might seem. Both are driven by fictions of agency. There's a fiction of agency over one's body in the 'digital' Quantified Self movement, a fiction of the self-made in the 'post-digital' DIY and Maker movements, a fiction of a more intimate working with media in 'analog' handmade film labs and mimeograph cooperatives. They stand for two options of agency, over-identification with systems or skepticism towards them. Each of them is, in their own way, symptomatic of system crisis. It is not a crisis of one or the other system but a crisis of the very paradigm of "system" and its legacy from cybernetics. It's a legacy which (starting with their mere names) neither "digital", nor "post-digital" succeed to leave behind.

It would therefore seem that both the digital and the post-digital (understood in a specific way) are stages in the development of a technologically-led re-appraisal of and approach to realities, but that neither can solve for us the continuing issues of agency, however fractured it may have become (cf. Thomas, (2021) on "Transcendent Conformity: The Question of Agency for Postdigital Humans", assessing the difference between transhumanist and critical postdigital studies, and McLaren, (2020) on "Postdigital Dialogues on Critical Pedagogy").

A healthy distrust of both the digital as well as the post-digital seems to be in order, then, especially as we are ever more defined by our sense of vision and its dispersal via a multiplication of fractured screens and mirrors. The necessity for global online engagement is not in question and, given technological development, the next logical step in distance interactions and learning. However, a critical discussion of what the screens screen is in order, just like such a critical discussion had existed for the singular TV screen over the last 90 years or so. The mere fact that screens have become ubiquitous in their multiplication does not absolve us of continuing to critically address their original ontological and epistemological threats they pose. All the more so, as our interactions with them have quickly become the (ever more unquestioned) building blocks for our understanding of the world, and this despite their broken promise of providing us with a perspective and despite their duplicitous nature. In education, they are the tools of choice to transfer and co-create the visions of tomorrow, in unison with our students. But just as in Alberti's day, the perspective they promise remains an illusion. In order to engage students in the critical construction of post-postdigital realities, the inherent Derridean *différance* between the screen and reality must be part and parcel of any pedagogy. And that, indeed, might be one of the most valuable lessons the virus has taught us.

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