

Tempora Mutantur, nos et Mutamur in Illis

(Times Change, and We too are Changed with Them.)

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Abstract The history has provided a reflection of to what extent science and technoogy might influence human life, from life changing advances to major devastations. Science and technology are invented and developed by humans but it might end up controlling them in the most ironic ways. We cannot escape the impact of digital technology on all aspects of our life, thus we need to revisit and realize the initial purposes of science and technological advancements. The mission now is for us as educators to assist young people in forming their future instead of being controlled by it. We need to turn them from addicted consumers into critical producers, who have something to tell to their own generation and who are able to tell it in media that appeal to this generation. May the negative impacts of this disruptive change in our civilization be no where nearly as devastating as the ones in the past.

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SOME SHORT HISTORICAL LESSONS

It's a Hexameter, a classical form of poetry, but frequently misattributed, in particular to Ovid. It's actually from after 1500¹. Why do I consider this an adequate citation for my introduction? Well, in 1439 Gutenberg invented a printing press with an arrangement of single letters and the world changed. „It played a key role in the development of the Renaissance, Reformation, the Age of Enlightenment, and the scientific revolution and laid the material basis for the modern knowledge-based economy and the spread of learning to the masses². (Marshall McLuhan, in „The Gutenberg Galaxis“). This invention had a massive impact on all aspects of life, and we should not forget that it wasn't always a comfortable one.

The first book printed by Gutenberg was the Holy Bible. But Martin Luther's 95 theses which sparked off the Reformation appeared as a printed edition in 1522. Within the span of only two years, Luther's tracts were distributed in 300,000 printed copies throughout Germany and Europe – and all hell broke loose! 30 years of war between religious and political factions, hunger and epidemics nearly turned Europe into a wasteland. In parts of Southwestern Germany only one third of the population survived. This war actually started between religious groups, but it soon became a war for power over Europe, not about who is right or wrong in religion. Reminds me of the sentence that wars never decide who's right – only who's left. It was actually preceded by 80 years of war between catholic Spain and the protestant Netherlands. Irony of history that your former colonial power had to fight for it's own independence not so long before colonizing others.

But let's turn to the spread of science instead of destruction. Ibn Rushd (or latinized Averroes), one of the greatest minds of the „Golden Age“ of Islam lived in the Moroccan kingdom in Europe and Northwestern Africa from 1126 to 1198. He studied law, philosophy, astronomy and medicine. His works later entered Europe, but were condemned by the Catholic church in 1270 and

1277. Nevertheless his thoughts continued to attract followers up to the sixteenth century. Ibn Rushd and Ibn Sina (lat. Avicenna, after whom until today many pharmacies in France are called) were among the great Islamic scholars to transfer the ancient Greek knowledge to modern Europe, which had lost the connection during the medieval „Dark Ages“. By the way, in his commentary on Plato's „Republic“, just like Plato, Ibn Rushd calls for women to share with men in the administration of the state, including participating as soldiers, philosophers and rulers³. He regretted that contemporaneous Muslim societies limited the public role of women and said this limitation is harmful to the state's well-being⁴. His scientific teachings were important not only for philosophical and political concepts of the „Era of Enlightenment“ in Europe, but to the overall development of physics as well.

WHAT ABOUT TODAY?

Why am I giving a short history lesson here? Because we can only speculate about the future by understanding the past. Digital technology and communication is as disruptive to human societies and their development as the printing of books was, and equally has both dangerous and helpful potential.

The dangerous potential is becoming quite obvious recently with so-called „Social Media“ – which history may one day call anti-social media. Just two examples: both the election of twittering president Trump in the U.S. or the horrible crimes against the Rohingya in Myanmar were massively influenced by „Fake News“. Not the ones Trump likes to call so – the free press - or similar minds like Erdogan just tend to shut down. No, I'm referring here to the kind of „news“ which are the product of an erosion of trust in free, professional, carefully researched journalism (the kind of Al Jazeera for example) and it's replacement by rumors and prejudice. Recently some prominent fathers of digital media like Jaron Lanier (the pioneer of Virtual Reality) are issuing a strict warning against the use of any social

media in the form that Facebook and similar services have today. He says they are threatening our freedom, democracy and even our brains.

Well, when I was a young man I used to ingest a lot of sci-fi books and films. In that era these spread big visions of a bright future, but big dystopias too. One of the latter was the takeover of power over humankind by robots and computers. They were imagined as massive, hostile machines stomping along and wiping humans out or enslaving them (think „Terminator“ or „Transformers“). Today it seems this takeover is in full function, but not by monsters of steel. No, by cute little machines instead, which we love, nurture and carry around voluntarily. They make us addicted like a drug until we think we can't live without them. We start to neglect our real relationships with the humans around us, our education, our work and even our own well-being. In biology you'd call such an entity a parasite! France is the first nation (AFAIK) to ban them from all schools. I suppose we'll see more such bans to protect learning and productivity in the future or a decline in these factors in many societies. Probably the drug addicts will try a lot of tricks to keep their parasites.

Enough dystopia. Just like the history of Ancient Greek knowledge, Islamic scientists and their Christian followers and further development until today proves: science has no borders and can't be divided by religion or nation. A scientifically proven fact is hard truth instead of fake news and the free exchange of information is sparking further development and discoveries. Digital technology brought us information at our fingertips. We have to learn how to efficiently search for helpful information, how to compare for validation and how to filter it from all the digital noise. Only then it can be very valuable for learning any new subject or continuing our own research based on it – even if printed books in a university library are still not outdated as long as not all of them are scanned and online. And to those who think that going back to the roots – whatever roots these may be – would be better than the modern world with all its risks and problems: there is no going back without killing the majority of human population. The first human who tamed fire to improve his food or started to think about the stars when looking up to the sky has brought us on a path without return. He or she has condemned us to the clever use of technology to repair the negative outcomes of technology itself.

CHANGES IN EDUCATION

So, what did IT (information technology) already change? Memorizing pure information is completely outdated. The storage in computers is more reliable and has more capacity than our own brain as long as it's related to established facts. Learning how to find, judge and use such information should be the aim of modern teaching. Sources for learning the practical use of digital technology, soft- and hardware alike, are available in abundance on the internet. There are texts, graphics and even video tutorials demonstrating the handling of such tools. Next step are user forums where you may ask specific questions and find a lot of support by helpful colleagues all over the planet. But to use such information, students will need to learn language. Yes,

English is still mandatory. Maybe Chinese one day, but unfortunately neither Bahasa Indonesia nor German will get you very far. Plus, there are the languages of specific fields of art or science. Or, let's rather say, vocabulary and it's meaning in a very specific context.

To evaluate such information, which is available in abundance, students need to learn rational thinking and discerning logic as well as search mechanisms. But also soft skills like netiquette (respectful behavior in forums), team-building and planning of workflow are needed. These are the things that have to be taught and experienced, no online course or tutorial can replace that. Finally, the biggest challenge for any university in art and design, the one task that seems so obvious and is so hard to do: teaching art itself. Composition, light, sculpture, architecture, color, rhythm, sound, music, motion, framing and acting are all components of that universalistic, unifying art of today. Film. Why film? Well, because it's my subject and I'd rather like to talk about something I know pretty well. I plan to show examples of student work in my presentation.

ACCESSIBLE TECHNOLOGY

When I started to study film we had Super-8mm and one or two rolls of 16mm for our final project. While that was good enough to understand the art of moving images, it always gave us a feeling of inferiority or poverty. Our products would technically never look as good as the ones from cinema. There were some festivals showing them to an art audience, but TV for example would never screen a Super-8 film, whatever it's artistic quality might be. It got worse when the first computer generated animations emerged from North America. Even German professionals didn't have access to that technology, which would cost in the hundreds of thousand dollars for a single seat. But I was so curious about those possibilities, it seemed like a dream coming true. I was lucky enough to get a stipendiate after my diploma for a place in Vancouver where I could work with such machines for a while (at the time, Canada was the center of this art). I did my first baby steps there. But after I came back to my country, it took years before the prices came down so far that even one single art school in Germany (Berlin) could afford such an image making machine. There was no industrial solution for recording the rendered images as a film, so we had to construct our own devices.

Compare that to now: the camera I'm holding here costs about 500 Euro second-hand and has better image quality than the best electronic cameras of the last millennium for tens of thousands of dollars. An already used computer for editing it's images, adding sound and refining colors would cost you about 1500 dollars. For good results you'll need only patience and knowledge, since this computer will be a bit slow. With an investment of about ten to twelve thousand dollars an institution can establish a working unit to produce at a level of technical quality like Hollywood. The rest is good ideas, mechanical and building skills plus good talent and crew.

INVENTING NEW ART FORMS

But why restrict digital art to pictures, film and animation only? Digital art can go far beyond that, from interactivity like in games to completely new forms of experience like Virtual Reality or Augmented Reality. These will even need a new artistic language for storytelling. In my view art universities are the place where this can be born, just like 100 years ago the Bauhaus developed new concepts for the young media of it's time, photography and film. But there is one condition for this: reach your hands out to computer science departments! A contemporary arts and design education should co-operate with programmers and electronics technicians. I'd go even further: modern artists should understand some basics of programming themselves, since this understanding will form ideas which will hardly come from the typical mindset of a programmer. Working with artists will enrich the education of students from computer science as well, since ideas and concepts from artists will help them discover new fields of application and designers can help them to shape better user interfaces.

CONCLUSION

We can't escape the impact of digital technology on all aspects of our life. But it's up to us as educators to assist young people in forming their future instead of being controlled by it. Let's turn them from addicted consumers into critical producers, who have something to tell to their own generation and who are able to tell it in media that appeal to this generation.

And let's pray that the negative impact of this disruptive change in our civilization is not as devastating as the one of early printing.

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